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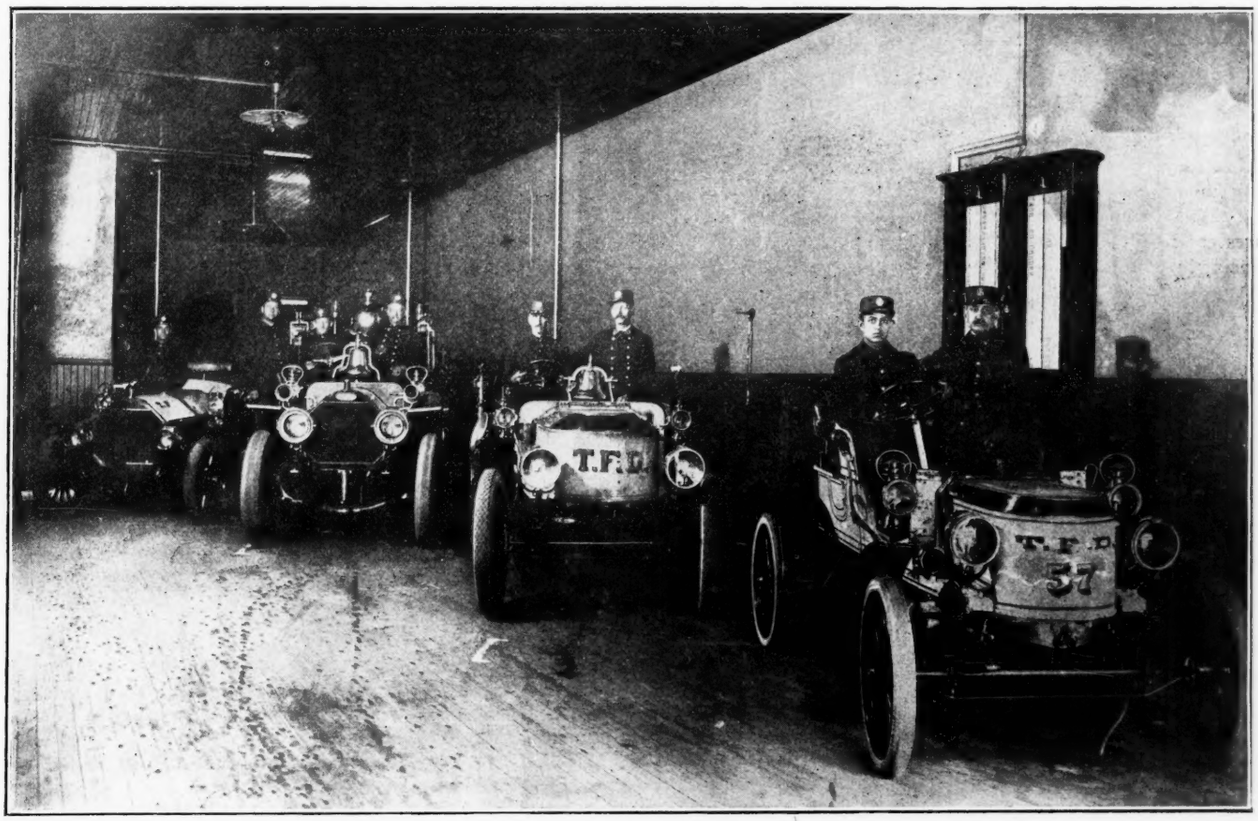


FIRE HEADQUARTERS, TRENTON, N. J.

Apparatus, from front to rear: Chief's auto, Stanley chemical wagon, four-cylinder Webb auto engine, Thomas supply car, so placed that any car can leave the house without disturbing the others.

FIRE DEPARTMENT OF TRENTON, N. J.

Five Pieces of Auto Apparatus—Cost of Maintenance Compared with Horse-Drawn Equipment—Remodeling of Headquarters to Provide for the Auto Apparatus—Equipment at Various Stations—Fire Alarm System

By EDW. F. CONNELLY

(From data furnished by J. Wallace Hoff, Secretary of Fire Board)

TRENTON, N. J., a city whose population is nearly 100,000, was the first city east of the Allegheny Mountains to have auto engines in service, and at present has five pieces of motor-propelled apparatus, including two Webb engines, one of six cylinders, capable of pumping 700 gallons of water per minute, and the other of four cylinders, with a capacity of 600 gallons; a Stanley runabout for the chief, a Stanley chemical engine and a Thomas supply car.

This city has had over four years' experience wtih the auto, and such has been the attending success that in the future, where practicable, only auto apparatus will be installed. At the present time there is under consideration the purchase of an auto engine for the thickly settled western section, and an auto truck for the eastern industrial section of the city. Over six years ago former Fire Chief Charles Allen (retired on August 19, last, after nine years' service, on account of illness resulting

from injuries sustained while in the service) conceived the idea of making the same power that runs the automobile do the pumping and presented his views to the Board of Fire Commissioners, who decided to allow one of the foremost auto companies at that time to perfect the plans. After a year and a half of waiting the contract was rescinded and the Webb Company took up the task, with the result that the first auto engine, of four cylinders, was received in July, 1909. After a thorough trial, which was a complete success, the Fire Commissioners awarded a contract to the same company for another engine, this time one of six cylinders, which was delivered in September, 1910. In the meantime the board had purchased the chief's runabout in March, 1907, and the Stanley chemical in June, 1908, these being the first two pieces of self-propelled apparatus in this State. The Thomas supply car was secured in February, 1910, and is used to deliver supplies to the various companies. Formerly this meant the hire of an extra horse and an entire day's work, while now the work can be done in a few hours.

Comparative Cost of Maintenance

The comparative cost of maintenance of Engine Company No. 2, horse-drawn, and Engine Company No. 1, an auto pumping engine, will no doubt prove interesting to the many chiefs who are considering the installation of auto apparatus. The figures are for one year ending September 1, 1911, as the auto engine had then been in service one year, and are as follows:

Engine Company No. 2

Second size Metropolitan Engine, department test 700 gallons, two horses, requiring as tender a combination wagon, carrying 1200 feet of hose, one thirty-five gallon chemical tank, 200 feet one-inch hose and two extinguishers, and engine equipment, drawn by two horses.

Value of engine and equipment and combination wagon and equipment, $8,896.

Average life of horses	8 years.
Average life of engine	20 years.
Average life of wagon	12 years.
Average life of harness	15 years.

Cost to maintain from September 1, 1910, to September 1, 1911 (in service 84 times):

Feed	$222.00
Hay	213.33
Peat moss	87.75
Horse shoeing	123.43
Soft coal	14.10
Harness repairs	1.25
Apparatus fittings	
Repairs and new parts	18.08
Kerosene (lanterns)	6.25
Oil, waste, chamois, sponges, grease, etc.	13.32
Time of superintendent of machinery in making repairs, at 60 cents per hour	6.00
Total	$705.51

The force consists of a captain, lieutenant, engineer, stoker, three hosemen, driver for the engine and driver for the combination wagon. The operation of this equipment requires an

Engineer	$1,300
Two drivers	2,200
Stoker	1,100
Total	$4,600

Engine Company No. 1

Second size Webb six-cylinder auto pumping engine, department test 715 gallons, carrying its own supply, 1000 feet of 2½-inch hose, and full equipment. No depreciation, after a year of service, in cogs, pump or motor. Tires still good.

Value of engine and equipment	$2,000.00
Estimated life of apparatus	Ten years

Cost to maintain from September 1, 1910, to September 1, 1911 (in service 79 times). Engine tested twice per day, fuel included going and coming and for pump power:

Gasoline, 76 tests, 18 gallons at 21 cents	$58.27
Tires and tubes	106.45
Motor oil	28.90
Grease, waste, chamois, polish, etc	5.85
Fittings—Pipe lines (carbureter), bottom of pump and repair to gasoline pump	22.35
Repairing suction	1.80
Superintendent of machinery, time on fittings at 60 cents per hour	30.00
Total	$253.62
Number of men in company	Seven
To operate engine, one chauffeur	$1,100

Summary.—The auto engine, with seven men, has six men on the pipe line. Steam engine, with nine men, has but six men on the pipe line, as one of the drivers takes care of the horses while at a fire. A saving is shown in the operation of the engines of $3,500 in favor of the automobile. Saving in cost of maintenance shows $451.89 annually in favor of the auto.

A conclusion as to the replacement of the two classes of apparatus at the end of their usefulness, would give the following:

Value of engine (steam) equipment, to last 20 years	$8,898.00
Average maintenance for 20 years	14,110.20
Cost of overhaul at end of 15 years	2,000.00
New horses at end of eight years	1,200.00
New harness at end of 15 years	120.00
New hose wagon at end of 12 years	1,400.00
Total	$27,728.20
Value of auto engine equipment to last 10 years	$8,000.00
Average maintenance for 10 years	2,536.20
Cost to overhaul at end of five years	1,000.00
Total	$11,536.20

Approximately three auto engines could be maintained (running expenses) for the cost of maintaining one steam engine.

If the life of a steam engine and equipment is 20 years and that of an auto engine but ten years, two auto engines in twenty years would cost $23,072.40, but there would be a saving of $4,653.80 in maintenance in favor of the auto engines; or three auto engines to be purchased and maintained for twenty years would cost $34,608.60.

In the manual operation of the two classes, there is a saving of salaries aggregating $3,500 yearly. In services of men on hose lines, of two companies of nine men each, the auto company could have eight men while the steam engine company would have but five or six men available.

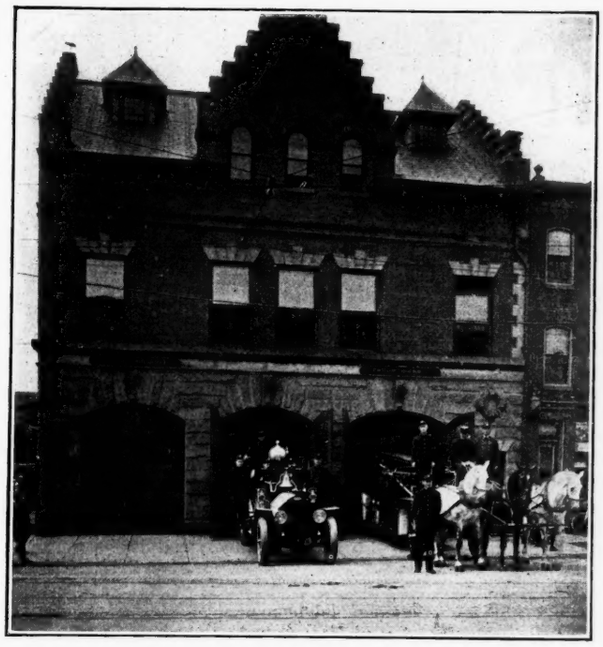
Remodeling Headquarters and Equipment of Stations

The department consists of eight engine companies, one chemical company and two truck companies in charge of a Chief and two Assistants. The following is a general description:

Headquarters, Perry Street, Stanley auto runabout for the Chief; Auto Chemical Company No. 1, which consists of the auto chemical engine, manned by four men, which answers to all alarms of fire in the center of the city. Engine Company No. 8, consisting of the auto engine, four cylinders, manned by five men and a captain, which answers every alarm of fire, no matter in what section of the city, with the Chief or his Assistant.

This building until last year housed horse-drawn apparatus, but when the autos came the Fire Board decided to remodel the building and had all the stalls taken out and the lofts made into an airy dormitory. The apparatus, as can clearly be seen in the cut, is stationed on the right side of the building, which is very narrow, and so arranged that each piece can be sent out without moving any other one. In the rear of the building is the auto repair department with repair pit, stock and tool room. On the second floor, front, are the executive offices of the Department and the fire alarm switchboard. Twelve men are stationed in this building.

Engine House No. 1, West Hanover Street, is a double station, housing a six-cylinder Webb auto pumping engine, a Deitrich aerial truck, a water tower, a reserve Silesby engine and a reserve two-horse Babcock double (60-gallon) chemical engine. The truck has a 65-foot extension ladder, with other ladders ranging in size from 12 to 50 feet; carries complete



AUTO ENGINE CO. NO. 1. HOOK AND LADDER CO. NO. 1

outfit of hooks, axes, etc., and two 3-gallon and two 6-gallon extinguishers.

Engine House No. 2, 318 South Broad Street, has a second-size Metropolitan engine, 700 gallons' capacity; two-horse combination wagon carrying 1200 feet of 2½-inch hose, 400 feet of 1-inch hose and two 3-gallon hand extinguishers.

Engine Companies Nos. 3 and 4, 718 South Broad Street and South Clinton Avenue, respectively, have practically the same equipment, but there is a reserve Button engine at the home of Engine Company No. 3.

Engine Company No. 5, Pennington Avenue, has one third-size Clapp-Jones engine, capacity 600 gallons per minute, and the same minor equipment.

Engine Company No. 6, Perry Street, has a second-size Amoskeag engine, capacity 700 gallons.

Engine Company No. 7, Hamilton Avenue, has a second-size Metropolitan engine. All have the same minor equipment.

The house of the last-named company was the last building erected by the city, the new company being organized in June, 1907. It is a fine type of suburban fire house and unquestionably a model of its kind. On the ground floor is the apparatus, while in the rear are the stalls for the horses, with a shed for the exercising wagon. On the second floor is a large dormitory, a general room for the men and a room for the captain. The outside appearance of the house is further beautified by tastefully-kept hedges and trees. The officers and men take pride in their home, and the captain, John Stiefold, and the firemen spend many hours in the improvement of the house. Instead of leaving the sharp corners of the wall as they were left by the plasterers, little strips of wood have been placed by the firemen on the edges wherever they appear. That there was a waste of light when the company was out at night was apparent to the captain, and he devised a system whereby exactly eleven seconds after the company leaves the house all the lights in the house go out. This was effected by a little ball so arranged that it lies on two inclined rollers. When the driver of the engine pulls his cord and leaves the building the ball begins to roll downward, and in just eleven seconds it falls into a can, where its weight causes the lights to go out. All that is necessary to relight them is to pull up on the cord, which is done by the first man to re-enter the house. Another invention is a catch made for the doors to the horses' stalls, so that the doors could not swing back and hit the animals as they came dashing out of their stalls.

The home of Truck 2, South Clinton Avenue, has for its equipment a Hayes aerial truck with a 65-foot extension ladder and other ladders ranging in size from 12 to 30 feet, also minor equipment, including a 50-gallon Hollaway tank.

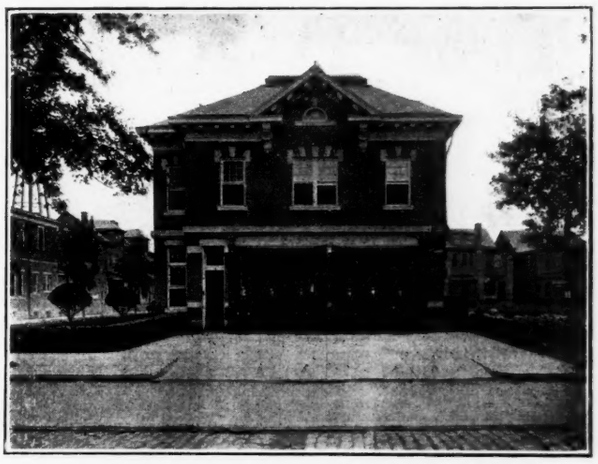
The department has about 21,000 feet of hose in good condition, including a new lot recently delivered, which has been distributed to the various houses, giving each company two full changes and a surplus supply.

Eighty-seven men man the companies, each engine company being composed of nine men, a captain, a lieutenant, an engineer, a driver and four hosemen; each truck company of a captain, a lieutenant, a tillerman, a driver and four ladder men. There is also a superintendent of machinery for the department.

Each member is on duty constantly, except an hour for each meal and twenty hours off each six days. The members also get a twelve-day vacation during the summer season. Each company is divided into watch squads, each watch consisting of four hours from 6 a. m. until midnight, while from midnight until 6 a. m. a special watch is kept throughout the department.

FIRE ALARM SYSTEM

The fire alarm system of the city is under the superintendency of Oliver M. Schafer and the apparatus in operation is as follows: One ten-circuit Gamewell battery-charging and circuit-controlling switchboard; one four-circuit Gamewell automatic repeater, 486 cells of 36-ampere-hour storage battery on telegraph circuits; ten cells of 36-ampere-hour storage battery on telephone circuits, 15 cells of primary closed-circuit battery on local instruments, 91 Gamewell street signal boxes, 62 private auxiliary special boxes, 18 10-inch, two 15-inch, one 12-inch and one 8-inch electro-mechanical gongs, three 12-inch combination gongs and visual indicators; also minor equipment. This year a new switchboard and repeater was installed at fire headquarters and a number of additional street boxes ordered.



MODERN SUBURBAN ENGINE HOUSE NO. 7
Equipment, horse-drawn engine and auto combination wagon

The underground cable system, combining both fire and police telegraph, consists of 11.36 miles of lead-encased cables of various sizes. The cables are composed of No. 16 Brown & Sharpe gauge copper conductors, with rubber or paper insulation, rubber insulation being used for the short sections and taps and the paper insulation for long sections and trunk cables. Over 1,393,132 feet of wire conductors underground, connecting the ten houses, have been laid by this department. The number of alarms per year averages about 200.

COST OF MAINTENANCE

The cost of running the department for the year ending March 1, 1910, was $117,000, which was spent as follows: Salaries, $96,058.56; maintenance, $9,638.50; fire alarm account, $2,044.67; hose and apparatus account, $2,802.02; building account, $1,252.54; horses and harness account, $1,335.46; printing account, $170.70; pension account, $917.55; new hose account, $2,080, and interest account, $700. Owing to the change

in the city's government no report for the year ending March 1, 1911, has as yet been printed. The appropriation for the year, however, totaled about $121,770.

History of the Department

Trenton, before the organization of the present paid department which came into existence in 1892, was protected by the oldest volunteer fire company in the United States, the Union Fire Company, which was formed on February 7, 1747, and until the formation of the Hand in Hand company in 1772 the department consisted of but the one company. The equipment consisted of small engines operated by hand power and each member had two leather buckets and a bag and basket. This was further increased in 1806 by the purchase of 52½ feet of hose. From this small beginning the department grew apace with the city's population, and at the time of the formation of the paid department, when the city's population was nearing 60,000, the fire fighting equipment consisted of nine steamer companies, two hose and two truck companies.

William McGill was elected the first chief of the paid department and at his death in 1901 (the position being held for life) the then first assistant chief, Charles Allen, was chosen chief. Under his direction the department made rapid advancement until to-day it is recognized as a model department for a city of Trenton's population. His resignation was received with great reluctance by the Fire Board and at the present time the vacancy at the head of the department has not been filled, though without any doubt Assistant Chief James W. Bennett, who has been acting head all through the year's illness of the chief, will be named permanently by the new City Commission. The acting chief has been with the department since its organization and has been a fire fighter for over thirty years. First Assistant Chief Walter Lanning is also a charter member of the paid department, beginning as a hoseman and afterward becoming captain of Engine Company No. 5 and second assistant chief. The acting second assistant chief, William Stackhouse, has had charge of the four pieces of auto apparatus at headquarters for two years and has been in the paid department since its formation. His thorough knowledge of auto engines makes him valuable as an assistant.

Until August 22, when the newly elected City Commissioners took charge, the department was governed by a bi-partisan Board of Fire Commissioners, organized on May 14, 1889, which expended the funds allowed by Council and managed the department. Now the power has been invested in one man, the Director of Public Safety, who at present is George B. LaBarre, who served several terms as Police Commissioner under the old Councilmanic rule, and who, with the assistance of the former secretary of the Fire Board, J. Wallace Hoff, who has been named as a deputy of the Commissioner, is expected to produce the best results from the department. The total fire loss has been over $1,500,000 since the paid department was organized.

MOTOR FIRE APPARATUS IN NEW YORK AND VICINITY

Apparatus Now in Use, Experiences with It, and Contemplated Additions in Five Cities of the Metropolitan District—New York to Purchase More than One Hundred—Yonkers—Paterson—Passaic—Newark

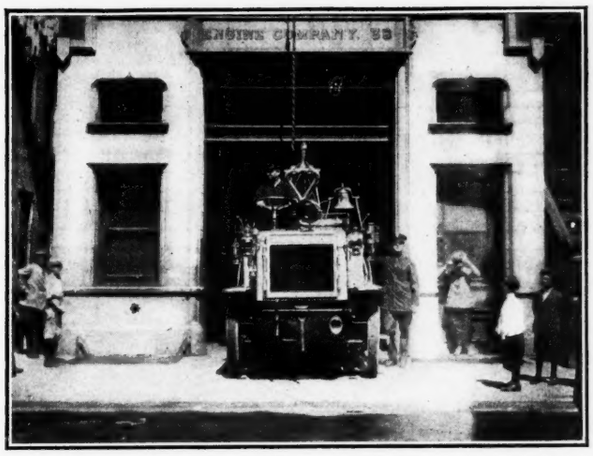
That New York's fire apparatus is to be motorized, that over one hundred motor vehicles will be ordered in the immediate future, and that the thirty new fire houses to be built next year will be equipped for motor apparatus alone, is the announcement made with the authority of Fire Commissioner Joseph Johnson. Nevertheless, New York has not yet a gasoline pumping engine in actual service, and the single motor-propelled steam fire engine now in service has undergone considerable repairs or alterations. Seeking the solution of this seeming inconsistency, a representative of the Municipal Journal, armed with a letter of introduction from the Commissioner's office, called at Engine House 58, where the gasoline-propelled steam fire engine has been installed for almost six months, together with a motor hose wagon.

A few minutes after his arrival the gong began to tap. The men gathered about the apparatus, but no further move was made until the first sound of the alarm was finished, and it was found to be from one of 58's stations. Immediately the engine and hose wagon were cranked and the firemen took their places. The writer, acting on the journalistic emergency, climbed up on the hose wagon. In five seconds (the desk clerk afterwards said) the apparatus was out of the house, going east on 115th street. This is an asphalt paved street, 30 feet wide, with intersecting streets five or six hundred feet apart. A block or two from the house the wagon was going twenty-four miles an hour, and the speed was still increasing. The engine was a block ahead and running away from the hose wagon. Still it seemed as though the conditions were perfectly safe and that there was not the slightest danger of collision or accident during the run. The corners of buildings did obstruct the view down the intersecting streets in an objectionable way, and the suggestion that has been made by city planners, with artistic effects in view, that corner buildings be rounded, would certainly contribute much to safety, and may become a necessity with the growth of motor traffic.

The apparatus made a straight run of half a mile to Third avenue. Here a quick turn to the south set the writer to calculating how much money could be saved in tire maintenance by taking corners more cautiously. A look behind, however, showed that the wagon had just cut in neatly ahead of an engine company coming down the avenue in response to the same alarm, and it was apparent that the driver was a man of great discrimination and judgment and not without the sporting instinct.

On arriving at the fire the motor engine ahead went to the hydrant at the nearest corner and the hose wagon went to the scene of the fire, prepared to run a line of hose back to the engine. The running time to the fire, 0.9 mile, was one minute and a half. Engine 58 arrived second, although its scheduled position is last of the seven companies answering this call box. The alarm had been turned in for a smoking stove. Incidentally, the assembling of three engines, two ladder trucks, two hose wagons and two battalion chiefs, nearly all within two minutes of the sounding of an alarm, was an impressive sight, and shows why New York does not have many large fires.

The alarm had sounded at 12:14. At 12:30 the engine and hose wagon were back in the house. At 1:13 another call came in. Again the same procedure; the autos were not cranked until after the first round had sounded. This time the writer rode on the rear step of the engine. There was a slight balk in getting away; a less experienced driver did not turn quite short enough, and lost a few seconds in slowing down and turning at a sharp angle to avoid the curb. Again a run to the east over the smooth asphalt and south through an avenue to 110th street. Riding on the engine was not as comfortable as on the hose wagon. In fact, at an intersection crossing a car track the writer's feet were jolted six inches or so above the step. The engine had to go around the block this time and enter at the further end. There was a poorly paved intersection and a sharp corner to turn, and the result was that though the second run was shorter than the first—about three-quarters of a mile—it took two minutes and the apparatus arrived in its scheduled position the last. This, also, was a case of a smoking stove, and the engine and hose wagon were back in their house eight minutes after the alarm sounded.



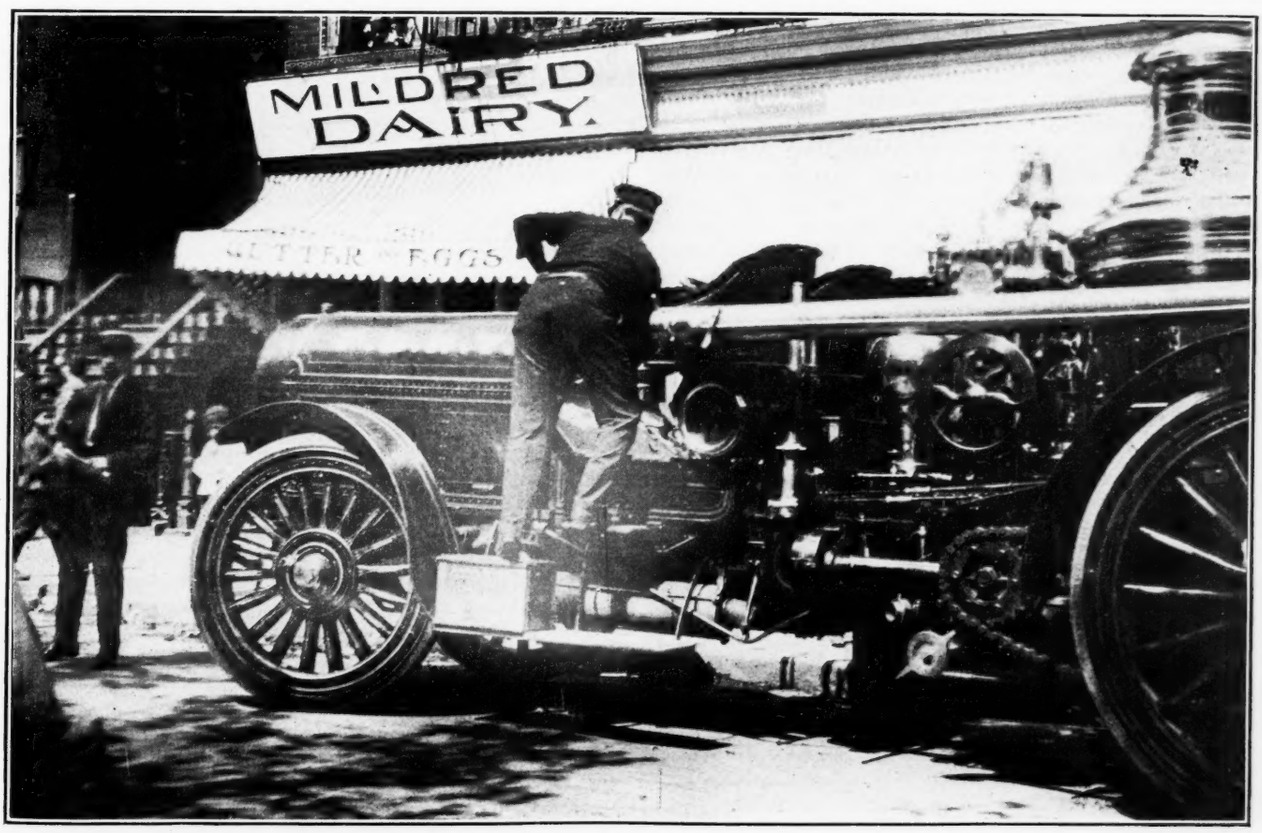
HOSE WAGON TENDING MOTOR STEAM ENGINE

With all doubts dispelled as to whether the motor-driven steam fire engine is a practical and successful apparatus, the details of construction become more interesting. The engine is a regular second size metropolitan steam fire engine, pumping capacity 700 gallons per minute, built in 1908. This is attached to a Nott tractor. The complete apparatus weighs about nine tons. Up to within a few weeks this machine was mounted on regular fire department wheels with 4-inch solid tires. As some trouble had been experienced with the radiator and the nuts throughout the machinery tend to loosen to an unusual extent, special wheels were recently made at the fire department shops and are now in use. Each front wheel weighs 650 pounds, and each rear wheel 850. The rear wheels are 60 inches in diameter, fitted with 6-inch solid Goodrich tires, said to be the largest solid tires ever made. The front wheels are 48 inches in diameter and also have 6-inch tires. The motor is extraordinarily large for any type of motor apparatus. It has four cylinders, measuring 5¾ by 8 inches, and develops 110 horsepower on the brake test. The machine has been run at a speed of 45 miles an hour on test. The gasoline tank carries 21 gallons. In ordinary service one gallon carries the machine about three miles.

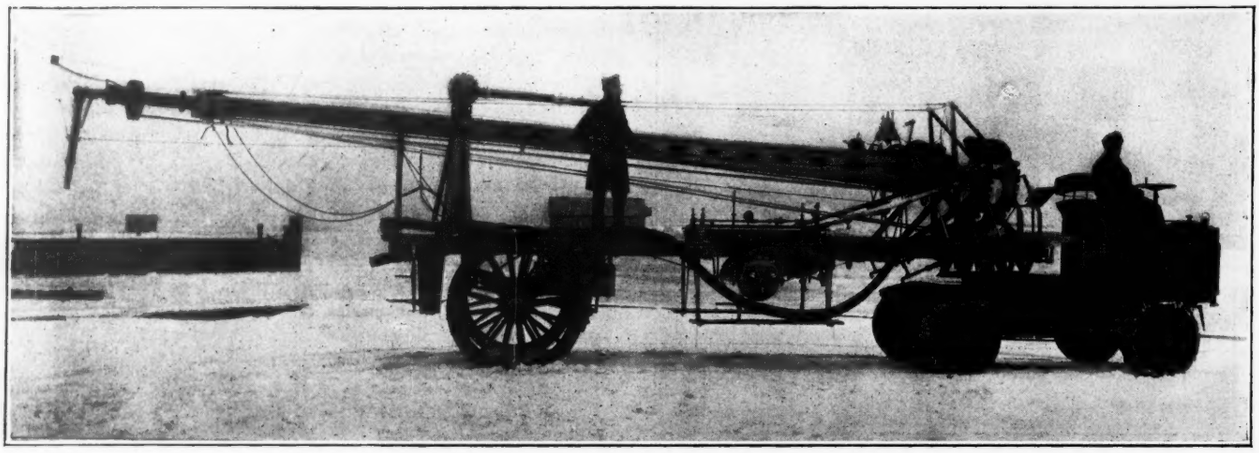
The engine has been constantly in service since March 20 of this year, has traveled over 500 miles in response to alarms that come in at the rate of 70 to 80 per month. Calls on the several companies of the New York fire department vary from an average of six a day to four a year, according to the location of the house. No. 58 is one of the companies having the largest average number of calls—in fact, there are only five other companies having as many or more. Outside of the difficulty with the radiator, which was the result of an accident that put the engine out of commission for twelve days, it has been in constant service, and has had no other care except such as the men in the company gave it. The company is a double company, having the auto hose wagon as well as the engine in their care.

The hose wagon is of the so-called high-pressure type, similar to those used in the high-pressure zone, and has a turret nozzle. It was made by the Webb Motor Fire Apparatus Company. It is driven by a four-cylinder, four-cycle motor, 5¼ by 6 inches, rated at 60 horsepower. The motor is of the Herschell and Stillman type. The body is fitted with riding accommodations for ten men, including the driver, and carries 2,100 feet of specially strong 3-inch hose. The firemen state that this wagon, when going at ordinary full speed, has been brought to a stop in a distance of 6 feet. They consider both the engine and the wagon safer than horse-drawn apparatus. A heavy horse-drawn apparatus can hardly be brought to a stop short of 100 feet, unless the horses are thrown or driven into some obstruction.

To return again to the question why New York is about to motorize its fire apparatus when it has only one satisfactory auto pumping engine in commission. In a semi-official statement given out by the Commissioner, although it is stated that no gasoline pumping engine has as yet passed the endurance test required—a test, by the way, severer than required by any other city—confidence is expressed that such engines have been or will be devised. The real explanation of the situation is



NEW YORK MOTOR FIRE ENGINE—JUST ARRIVED AT SCENE OF FIRE

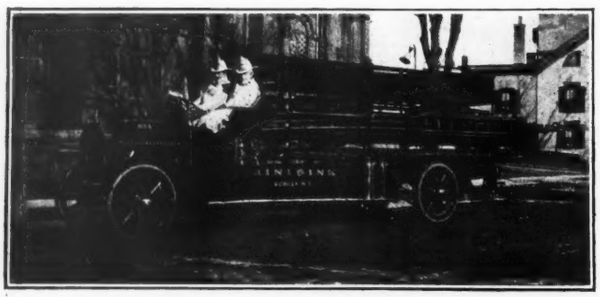


NEW YORK WATER TOWER—GASOLINE-ELECTRIC PROPULSION

that, owing to increased water pressure in the mains, pumping engines are becoming of relatively less importance than formerly. First, there is the high-pressure district in Manhattan, which includes a large portion of the city south of Twenty-third street, where through a special system of mains and pumping stations any pressure up to 300 pounds is available at the hydrants. As a matter of fact, this pressure is much more than is needed and about 100 pounds is that ordinarily used. This high-pressure zone is being extended every year, and there is a similar system in that part of Brooklyn where the hazard is greatest. Of even more general importance, however, as affecting nearly the whole area of the city, is the new Catskill water supply, which will give a gravity pressure, in any low-lying part of the city where suitable connections are made with the main aqueduct, of about 130 pounds. It seems probable, therefore, that in the course of a few years throughout the greater part of the city sufficient pressure for fire purposes may be obtained without the use of pumping engines. In the thinly settled outskirts of the city chemical engines will play an increasing part. So the role of the powerful pumping engine will be more limited in the future, though it would be a rash prophet who would venture to state to what extent it can be dispensed with.

In the present motor equipment of the New York Fire Department there are 29 cars in actual service. Of these 19 are touring cars and runabouts used in transporting the commanding officers to their stations of duty and elsewhere. The remainder are fire-fighting apparatus, and include the Nott tractor already described, three Webb high-pressure hose wagons, equipped with 60-horsepower motors; one Knox high-pressure hose wagon of 50 horsepower, one Couple-gear water tower, a four-cylinder gasoline engine, two Victor trucks used as supply wagons and equipped with special stake bodies, and four other trucks in the same branch of service.

The water tower is 45 feet long and weighs about seven tons. This piece of apparatus is a particularly good example of the value of motor traction. Even without the motor apparatus it is too heavy for even three horses to draw at a desirable speed. With the motor it makes 15 miles an hour easily. This tower consists of a standpipe 45 feet long, as it is carried, which can be extended to 65 feet when elevated. The nozzle is directed from the platform of the truck and several lines of hose may be siamesed to it. To adapt this tower for motor traction the front wheels were removed and in their place was put a four-wheel Couple-gear tractor. This carries a four-cylinder gasoline engine of 50-horsepower capacity, direct-connected to an electric generator. Current from this is carried to four motors, one in each wheel. By suitable gears the power is transmitted to each wheel independently. The tower has been in constant service with excellent results, the apparatus now arriving at fires much more quickly after the alarm than it did formerly.



TYPE OF MODERATE SIZED LADDER TRUCK

The high-pressure hose wagons are all of the same general type as the Webb wagon already described, which is housed at No. 58 house. Excepting the ladder trucks and the towers these hose wagons seem destined to play the principal part in fire fighting in New York.

The supply wagons do not require any special description except to state that they are of one and a half tons' capacity. The gasoline pumping engine, though being used, is understood not to have come up to the endurance test required—eight hours' continuous run at 700 gallons per minute capacity.

An appropriation of three-quarters of a million dollars has been secured for additional motor apparatus, and it is expected that by next spring considerably over 100 new pieces will be in service. Commissioner Johnson has appointed a board consisting of Deputy Commissioner Philip P. Farley, Chief John Kenlon, Battalion Chief John P. Howe and Captain Charles S. Demarest, foreman in charge of the repair shops, to work out the plans for this wholesale introduction of motor-propelled equipment. This board is in correspondence with manufacturers of gasoline pumping engines in order to get their views of the best type of that sort of apparatus. It is hoped that a reliable gasoline engine of ample capacity will be found. If not, the steam fire engine with gasoline traction will be adopted. Very likely both types will be used.

In the matter of hook and ladder trucks, gasoline traction has proved its efficiency in other cities. The motor traction makes it possible to carry heavier loads, consequently larger ladders. Two types of hose wagons have been developed so far, one in which the fifth wheel of the present truck is carried on the rear of a substantial four-wheeled automobile chassis, like those manufactured by the Seagrave Company. Another suitable type is a four-wheeled truck of the general type shown in the illustration, made by the Victor Company, and in use in Goshen, N. Y. This particular piece of apparatus has a four-cylinder, 50-horsepower motor, giving it a speed of from two to 25 miles per hour. The drive is by chain to sprockets on rear wheels. It carries ladders of the following sizes: 45 feet, 35 feet, 24 feet, 20 feet and two 16 feet. The service of this truck in a small town has of course not been heavy. On the 4th of July last it made an excellent run of three miles over muddy roads with 11 men riding on it.

One of the most important pieces of apparatus in the new service will be what are called "motor scout wagons." These are the type more generally known as combination chemicals, though the idea of squad wagons may be more fully developed; that is, there may be more room for men and less for hose than in the common type.

Of the 100 or more pieces of apparatus about to be ordered it is expected that 30 will be motor-driven hook and ladder trucks. Seventy-five horsepower is stated to be the engine capacity desired. There will be 20 high-pressure hose wagons. Probably 5 motor-driven water towers will be purchased. About 15 of the scout chemical engines, with speed capacity up to 60 miles an hour, will probably be included in the first order. There will probably be 15 or 20 pumping engines ordered. Presumably all battalion chiefs will be provided with cars, and there will be more supply wagons.

An article dealing with the future of the New York Fire Department is not complete without some reference to the Bureau of Fire Prevention which is to be organized in accordance with a recent act of the Legislature. Every building in the city will be placed under the supervision of the fire department. The Commissioner is given authority to order any building vacated if the proprietor refuses to install in it such safeguards as the bureau orders. The fire prevention bureau, in the opinion of those familiar with the situation, is destined in time to become fully as important as the fire extinguishing service.

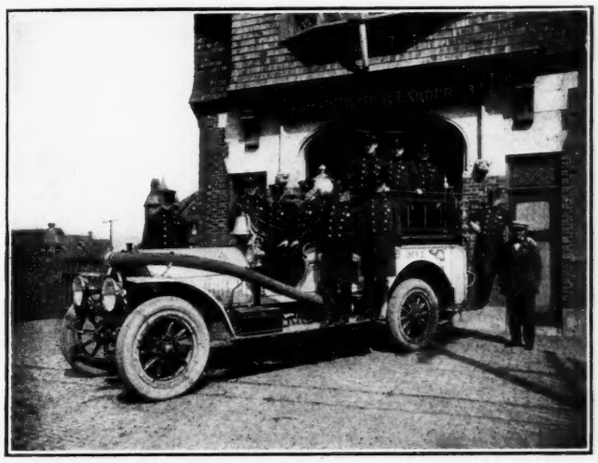
AUTO APPARATUS IN YONKERS

THE motor proposition for fire apparatus impresses different people in different ways. This is the way it seems to Chief James J. Mulcahy, of the Yonkers Fire Department. The efforts of manufacturers of fire department devices for years have been to invent appliances that will save time. The attention of fire department authorities has been directed toward the same end. Even seconds and fractions of a second have been considered important. Sliding poles were installed, automatic releases for horses, harnesses held in position and fastened by snaps—everything that could be thought of to save time. This was the situation a few years ago. An apparatus responds to an alarm with horses galloping at full speed. Some one comes idling along with a pleasure vehicle, increases its speed and passes the fire apparatus as if it were standing still. Bearing in mind the accepted policy of the business, the conclusion is inevitable that motor propulsion must be adopted.

That admitted, the problem remains to standardize the fire apparatus to suit the limitation of the motor vehicle. This problem has already been fairly well solved in the matter of chiefs' wagons, chemical engines and perhaps ladder trucks. In the matter of pumping engines the solution is not yet so clear. The auto steam engine is heavy and expensive, though it does the work. A gasoline engine operated by the motor that drives the vehicle is theoretically simplest and most desirable. The centrifugal pump is most easily connected with the shaft of the motor. Although there have been great improvements in centrifugal pumps in recent years and the centrifugal pumping engine has been proved to be a practical working proposition, as a question of hydraulics the piston pump is better. The piston pump is positive in its action, while an increase in resistance to the stream from a centrifugal pump greatly decreases its capacity. The problem that has to be met with in a piston-pumping motor engine is the means of changing the horizontal circular motion of the gasoline engine to the vertical reciprocating motion of the pump. These are the problems that fire engineers are waiting to see solved—the adaptation to the motor fire engine of a better centrifugal pump or improvement in application of power to a piston pump.

The first pieces of auto apparatus installed in Yonkers were two Boyd combination chemical and hose wagons installed in October, 1910. These wagons have been in constant service covering wide areas of hilly territory, and have proved very satisfactory. They answer about 30 or 35 calls a month each. The equipment of both is the same, namely, 200 feet of ¾-inch chemical hose, 700 feet of 2½-inch fire department hose, one 12-foot ladder, one 20-foot ladder, one 40-gallon chemical tank, and two 3-gallon extinguishers. The wheels are equipped with 5½-inch by 38-inch Fisk pneumatic tires. The same tires delivered with the machines are still in service. Each company is composed of seven men.

In speaking of this apparatus and fire department conditions generally in Yonkers, the National Board of Fire Underwriters says: "Response to alarms is somewhat delayed by the many hills, where detours are necessary, and by long runs for horse-drawn apparatus. These conditions are best met by using automobiles, which service has been inaugurated in the department, and should be further increased. * * * Automobile apparatus is well adapted for suburban work where long runs over poor and hilly roads are necessary."



YONKERS GASOLINE PUMPING ENGINE

The first pumping engine ever owned by the Yonkers Fire Department is a Webb 700-gallon capacity engine put in service in February, 1911. Yonkers is a hilly city, with a high and low water service. The water pressure averages in the high service 75 pounds; in the low service, 88 pounds, and in the principal mercantile district, 110 pounds. Consequently, there has been little need of pumping engines. In a certain large section of the high-service area, however, the pressure is as low as 30 pounds. This is a thinly settled suburban section containing many high-class residences. The wisdom of securing this pumping engine was demonstrated at a fire last winter in a valuable residence, the loss in which would probably have been total if it had not been for this engine. This company, No. 5, covers a wide territory, its furthest station being several miles away. The service is not heavy—10 or 20 calls a month. The machine has covered about 800 miles, including runs made for tests and exhibitions in pumping for the benefit of guests from the fire departments of other cities. The tires, 6 inches by 40 inches, Fisk pneumatic, are the same ones delivered with the engine, except that a Diamond tire has replaced the original one on one of the rear wheels. A chain is generally used on one rear wheel. The machine weighs four or five tons equipped. The engine is six-cylinder, 90 horsepower. Nineteen lengths of 2½-inch hose, one 11-foot roof ladder, a 20-foot extension ladder, two three-gallon hand extinguishers and a Marine Torch Company's light are carried. There are 14 men in the company. The house also contains a horse-drawn ladder truck. The speed of the auto engine is said to be limited in practice to 20 or 30 miles an hour. The department is considering the installation of other auto apparatus, the greatest need at the present time perhaps being an auto truck.

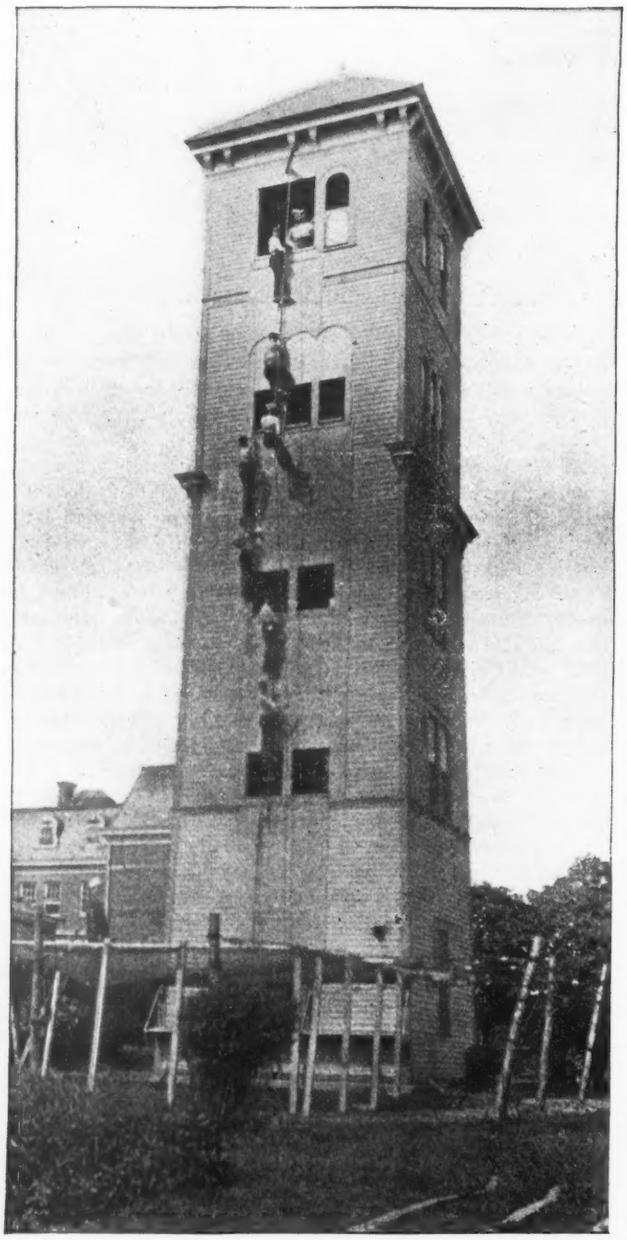
An innovation in the department is about to be inaugurated by Commissioner of Public Safety Flemming. Recognizing the need of greater mechanical skill in the personnel of the department, particularly in the care of auto apparatus, the commissioner has requested the Civil Service Commission to require that applicants for such positions be skilled mechanics.

MOTOR APPARATUS IN PATERSON

Important additions to the fire department of Paterson, N. J., had been made just before the value of motor apparatus had become generally appreciated. Hence, not wishing to discard new apparatus, the department is not now strong in the newest types. However, extensive plans are now being carried out for the conversion of the best of the horse-drawn apparatus to motor traction. Chief Stagg's opinion regarding motor-pumping engines is as follows:

The status of the steam fire engine is fixed. No one doubts its capacity to do the work. The steam engines can be provided with motors, which make the engines much more effective than when drawn by horses, but this equipment is heavy and expensive. Theoretically it ought to be possible to do better. Fire engineers have for years figured with certainty on the basis that one horsepower of boiler capacity meant 10 gallons' pumping capacity. There seems to be no insuperable reason why the capacity of a gasoline pump should not bear approximately the same ratio to the capacity of the gasoline motor. As gasoline engines of 100 horsepower are in daily service on automobile trucks, there seems to be no reason why a gasoline pumping engine of 1,000 gallons capacity per minute—equal to that of the best steam fire engine—cannot be devised. Fire department authorities are simply waiting for some one to do it. In the meantime they will have to be satisfied with gasoline engines of smaller capacity or motor-propelled steam fire engines.

PATERSON'S GASOLINE PUMPING ENGINE



DRILL TOWER—PATERSON FIRE DEPARTMENT

At the present time Paterson has two pieces of motor apparatus, a Howe pumping engine and a converted Boyd chemical of large capacity. The chemical engine is centrally located in what was once the main fire hall, but which is now eclipsed by the new central fire hall nearly completed, which will contain one of the most powerful equipments of any single house in the country. The Boyd chemical engine, No. 11, is of the old type, with two large Hollowell tanks, 60 gallons' capacity each, in the rear. Asked as to whether the whole contents of both tanks were ever used, the officer in charge said that it had been on a number of occasions, but not frequently. The motor of this engine is 20 horsepower, giving it a speed of 25 or 30 miles an hour on the level, which is considered sufficient. Additional horsepower is needed where an engine must answer calls on the hills. The drive of this engine is direct through shaft and gears. The machine has been in service since August 14, 1910, and has answered about 25 calls a month. Four men compose the company.

The Howe pumping engine was installed in a new house in a suburban location, Twenty-sixth street and Seventeenth avenue, on high ground, in October, 1910. The water pressure in the territory covered is about 50 pounds. The number of calls averages about 12 or 15 a month. The front wheels of this engine are 2½ inches by 36 inches, with solid Diamond tires; the rear wheels have 5½-inch by 36-inch solid tires. The horsepower of the engine, which is a National, is 75. The pumping is done by piston pumps, of which there are six, located back of the rear axle. The cylinders are 5 inches in diameter and have a 3-inch stroke. The pistons work off a cam shaft. The capacity of the pump is rated at 600 gallons per minute. The pumps are said to run slowly and steadily. The machine is geared to run 30 to 35 miles an hour, but new gears are to be used which will give a speed of 40 to 45 miles. The chassis is of pressed steel, reinforced with wood. Seven men compose the company. The engine carries 800 feet of 2½-inch hose, two 1¼-inch Callahan shut-off nozzles, 13 feet of soft suction, two 3-gallon hand extinguishers and two roof ladders. The engine is reported to have given perfectly satisfactory service and has never balked or failed to perform its duty in any way. The severest practical test it ever had required three hours' pumping, at a theatre fire.

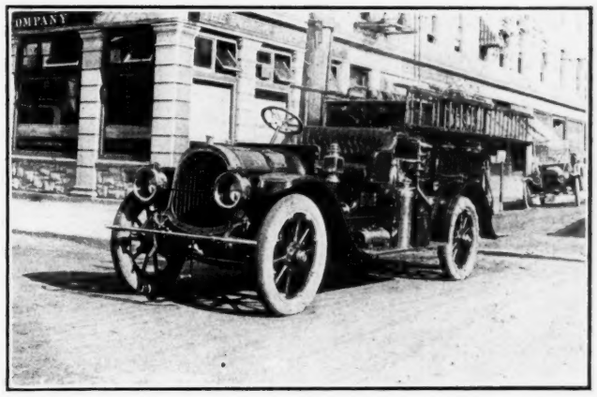
Plans for improvement of the motor equipment consist in converting to motor traction (contracts for which have already been made) two steam engines, two combination wagons and one motor truck. A chief's car will also be purchased, in addition to the one now used by Chief Stagg. All of this apparatus will be installed in the new fire hall. The plans for this were made before it was decided to motorize the apparatus, hence the quarters are larger than are absolutely needed. The

spare space will probably be used for storing reserve apparatus or for a repair shop. The conversion of the engines to motor propulsion is interesting because the engines are of the largest capacity—1,000 gallons per minute. They are now being made over by the Nott Company after the plans of the New York engine No. 58. They will have heavy wheels and 6-inch tires like those recently put on the New York engine. The engines are Metropolitan engines, with Fox boilers. To act partly as tenders for these engines two large combination chemical and hose wagons have been shipped to Philadelphia, where they will be furnished with motor equipment by the Boyd Company. The other large piece of apparatus to go in the central house is a 75-foot aerial ladder. This has been shipped to Columbus, and will be made over by the Seagrave Company.

A new feature of the Paterson Fire Department has been the establishment of a drill school. A tower, shown in the illustration, was built on ground belonging to the city. In order to teach men the routine of a drill school relays of men were sent over to New York and assigned to duty in the New York training school. There they learned the best methods of ladder climbing, the use of scaling ladders, life nets and other devices. The Paterson school is now in operation and it is stated that the men are deriving much benefit from it. The courtesy extended by New York to Paterson firemen is now being extended by Paterson to Passaic firemen and men from the latter city are now regular attendants at the school.

MOTOR APPARATUS IN PASSAIC

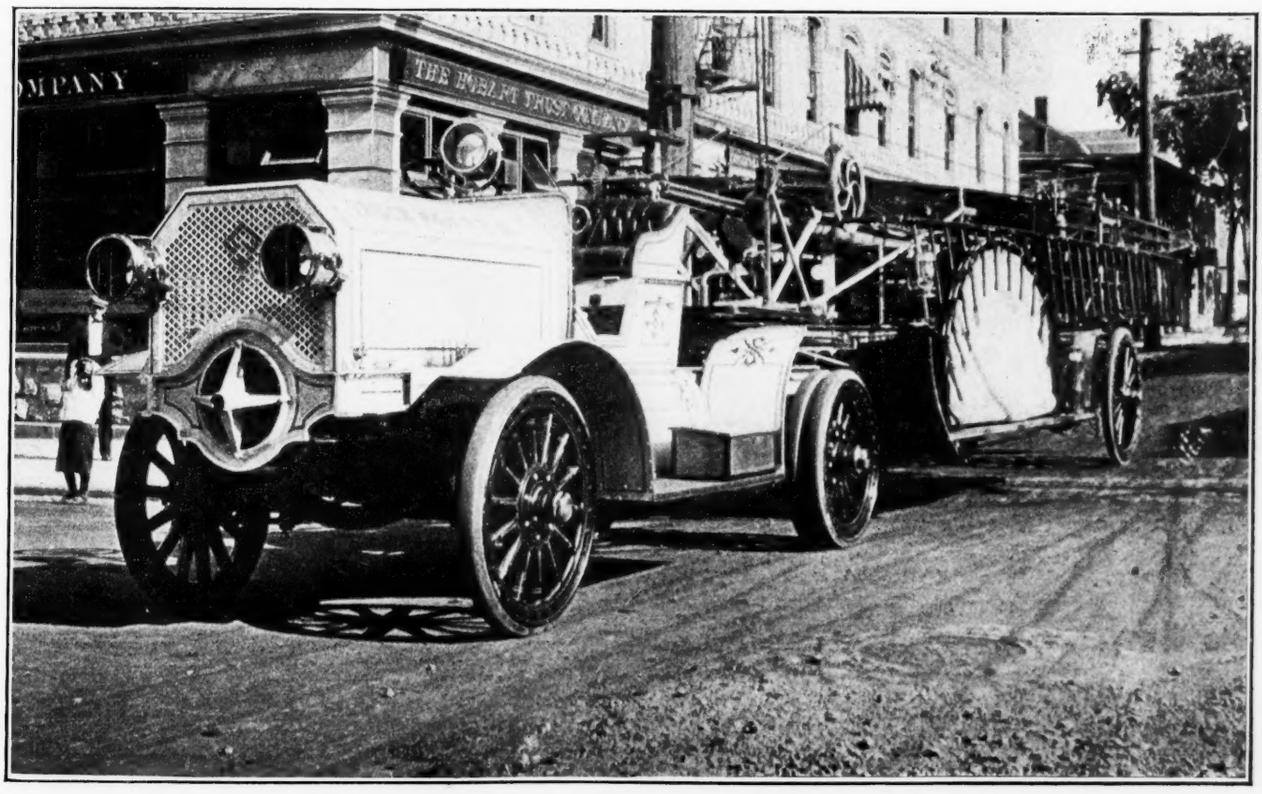
THE city of Passaic, N. J., is establishing a record in fire department management. Less than two years ago the department was on a volunteer basis. Now it is a fully paid department. In the first year of its organization the annual per capita fire loss was reduced from $2.50 per capita to 80 cents. Motor fire apparatus at once attracted the attention of the city officials and pieces have been ordered from time to time. The latest step, recently taken, was to place an order for the conversion of two combination chemicals into auto vehicles. When these are finished, probably in about a month, there will not be a horse in service in the fire department, and Passaic will have the distinction of being the first fire department of its size to be organized on a wholly motor basis. Much of the credit for the change from volunteers to paid and from horse-drawn to auto basis is due to former Mayor General Bird S. Spencer.



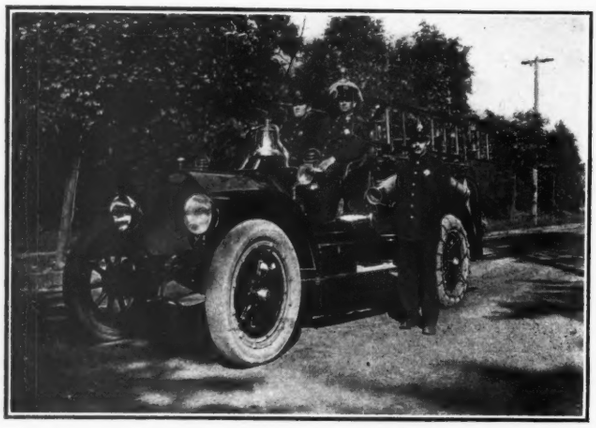
ONE OF PASSAIC'S COMBINATION CHEMICALS

Passaic is a city of about 45,000 population and an area of less than four square miles. It consists of a central business and manufacturing district on low ground, and residence section on surrounding hills. The manufacturing companies, at least the large ones, maintain quite effective systems of fire protection of their own, so that the city fire department is not ordinarily called upon to protect them. The water pressure in the hydrants, except on some of the hills in the residence districts, is sufficient for ordinary fire purposes without the use of pumping engines.

The fire department consists of a chief, R. H. Bowker; an assistant chief and about 40 men. Nearly all of the men were selected from the membership of the old volunteer department, so that they are familiar with local conditions. Each man works eight days and has the ninth off. The fire-fighting equipment will consist of a chief's car, one gasoline pumping engine,



PASSAIC'S 75-FT. AERIAL TRUCK WITH GASOLINE TRACTOR
Remodeled Horse-Drawn Truck About Three Years Old



PASSAIC'S GASOLINE PUMPING ENGINE

one ordinary ladder truck, one aerial ladder truck and four combination hose and chemical wagons.

The main fire house is located a short distance from the principal street, and near the center of the business section. This house is a double one, the spaces allotted to the two companies being separated by a wall into two halls. In one hall is the chief's car on one side and a Boyd combination chemical and hose wagon of standard manufacture on the other. This apparatus, on account of its location and suitability to the service required, will probably have the heaviest service of any in the department. The other hall in the central fire house is occupied by an aerial truck. This truck, originally horse-drawn, and only a few years old, was equipped with Seagrave chassis by the Combination Ladder Company, at a cost of about $5,200, and put in service May 22, 1911. The engine is six-cylinder, four-cycle, 5¾-inch bore by 6-inch stroke. In this machine the fifth wheel of the truck is placed on a corresponding number over the rear axle of the chassis, thus making the motor truck a six-wheeled vehicle. The tires are Republic solid rubber, the rear wheel of the chassis having dual tires. The cost of this truck for one month, including testing the engine four times a day, was only 55 cents for gasoline and lubricating oil.

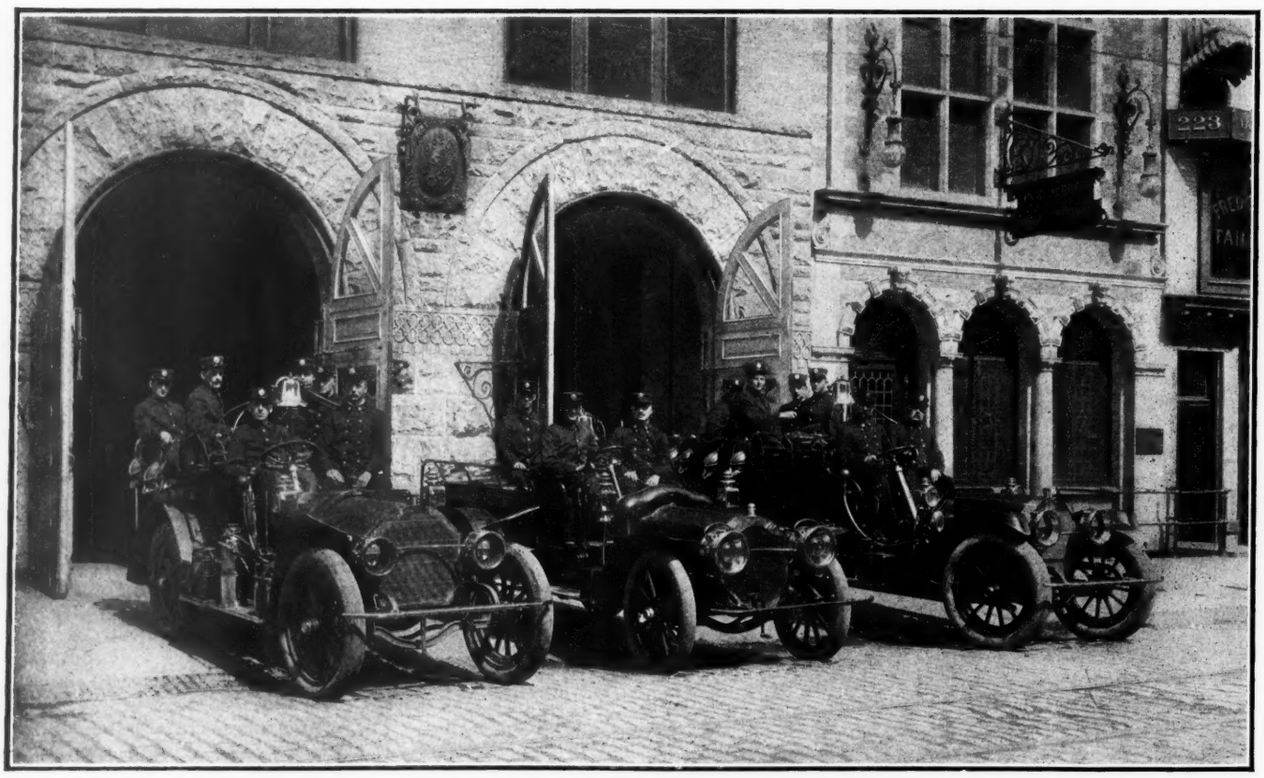
The suburban section at the southern end of Passaic is protected by a Webb motor pumping engine, 700 galons' capacity, and a motor truck, each in a separate house. The truck is an old one converted to motor traction by the addition of a Seagrave chassis, and put into service in this form April 6, 1911. The auto alone weighs 6,500 pounds, and the truck alone 4,000 pounds, making a total of 10,500 pounds. The truck carries the following ladders: One 60-foot extension, one 40-foot extension, one 28-foot and one 24-foot, 14 and 16-foot roof, pompier and baby extension. The ordinary speed of this truck is 10 to 15 miles per hour. It answers about 10 or 15 calls per month. The men in charge say that the apparatus works in a satisfactory way in every respect—much better than a horse-drawn truck.

In the northern end of the town there is a motor combination chemical. The present plans for the department will be completed when two horse-drawn chemicals are provided with motors. A contract for this work has been made at the price of $3,000 each. The department will still have other apparatus in reserve, including three steam fire engines, but no horses will be provided for them. If needed they will be drawn behind one of the motor vehicles which would be sent back for it.

The recent letting of a contract for the installation of an improved fire alarm, telegraph and police signal system to the Gamewell company is another important step in the equipment of this department. The operator's room will be in the central fire house, which is adjacent to the police station. Altogether Passaic will have a model fire department for a city of its size.

AUTO APPARATUS IN NEWARK

The Newark, N. J., Fire Department has but one piece of motor fire apparatus in service, not counting the chief's car. The fire loss in the city has generally been high, owing perhaps to poor building construction, that last year having been about $1,000,000. Whether the large fire loss has any relation to the deficiency in auto apparatus is uncertain, but the municipal authorities are now showing great interest in auto apparatus



NEWARK PROTECTIVE CORPS
New Wagon on Left, Old on Right, General Utility Wagon in Center

and a large delegation of officials will attend the Milwaukee convention for the purpose of studying the exhibits of such apparatus there. It is stated that the large loss is due in part to the fact that fires seem to gain great headway before alarms are turned in. If auto apparatus would not overcome this trouble, at least their installation would insure quicker response. Perhaps, too, the adoption of autos for the use of chiefs and battalion chiefs might tend to quicker discovery of fires. It is stated that in Springfield, Mass., where liberal provision is made for chiefs' cars, a surprising number of fires are discovered by chiefs as they make their rounds in cars. Perhaps they detect the peculiar smell of fire more readily than citizens or policemen, and hence are the first to turn in the alarms.

The one piece of auto apparatus in Newark is an engine installed in a suburban station where the duty is very light. It is a regular 700-gallon Webb engine, six-cylinder, 90-horsepower. It was installed May 24 of this year, and since then has had but 14 calls. At one fire it pumped for two hours without a hitch. It is taken out and tested every two weeks, as is the custom with steam fire engines. It has never balked or failed in any way in service or test, and has cost little or nothing for maintenance and repairs. The 6 by 40 Fisk tires look nearly as good as new. The general appearance of the engine is a little different from the ordinary on account of the attachments and ways of carrying them. The suction hose is carried on brackets at the side of the car in a straight position, without the usual curve. This is expected to lengthen the life of the hose. The front of the car is provided with an Up-or-down fender, a steel framework capable of being placed in two positions, provided with springs for resisting shock. There are only four men in the company. It is understood that the area allotted to this engine will soon be greatly extended.

Although the Newark Fire Department is not as yet strong in motor apparatus, it has in the underwriters' protective service an automobile patrol wagon with a remarkable record. So far as known its record for number of calls answered and mileage covered is unequalled by any vehicle in the fire service in any city. An account of the machine and the work of the corps was given in the MUNICIPAL JOURNAL, August 17, 1910. The protective wagon, a Locomobile, as stated in that article, was put in service October 1, 1908, and up to June, 1910, had answered 1,469 calls and traveled 3,933 miles. From June, 1910, to July 21, 1911, the car answered 1,132 calls, bringing the total runs since installation up to 2,501; and it traveled 2,613 miles, bringing the total mileage up to 6,546.

During the last year the protective corps performed at least one notable service. At the factory fire where over 30 lives were lost the protective wagon was among the first to arrive. The men carried a net to the rear of the building where a crowd of girls were seen about to jump from a fourth-story window, and while some held the net others pulled the girls out of the net as fast as they reached it. About 15 had been caught successfully, when five, landing together, tore the net from the men's hands. It was all over in a minute. The wagon then took two loads of the injured to the city hospital, while a member of the corps notified all hospitals by telephone to send ambulances. If this corps had had a horse-drawn patrol wagon it probably would not have arrived in time to be of any service.

In July of this year this car was taken out of service for a general overhauling, and its place taken by a new locomobile of similar though somewhat heavier construction. The old car, in spite of the mileage and very heavy load and high speed ordinarily maintained even over rough pavements, was still in good condition. The number of calls is getting to be too heavy for one machine to answer, and of course there is always a chance of its being put out of commission by an accident. The repairs consist in taking off the body, scraping and repainting and making good any defect that may be found. It is expected that the repairs and painting will cost about $500. The work will be done by expert machinists from the Locomobile Company, using so far as possible the protective corps' men, with a view to familiarizing them with the construction and care of the machine.

The new car has a chassis 16 feet long, two feet larger than that of the old car, and the side bar is three-quarters inch wider. The other differences between the old and new cars are not sufficient to attract the attention of a person who is not an expert on automobile construction. The specifications under which it was furnished state that it is designed and constructed specially for fire duty service, and every piece of material must be specially selected. The motor has four vertical four-cycle cylinders. The crank case is made of bronze. The crank shaft is a solid bar of alloy steel. The carburetor is of the float-feed, single-jet type, automatic in action. The ignition is make-and-break and battery. The radiator is the honeycomb type. It is carried in a flanged cradle of pressed steel, securely bolted. The drive is double chain from jack-shaft to rear wheel sprockets. Transmission is of selective type, four speeds forward and one reverse. Springs are, front, 40-inch by 2-inch; rear, 50-inch by 2-inch, semi-elliptical alloy steel. Tires are 40-inch by 6-inch, Fisk demountable detachable. Wheel-base is 148 inches from center to center of hubs. The weight of the new car, with its 35 blankets, miscellaneous equipments and men, is nearly 8,000 pounds. The old crew in service condition weighed about 7,000 pounds. In the illustration the small car in the center is a new one used for following up after a fire, picking up the blankets, etc.

The selection of a second car so nearly like the first for the use of a company which sees such severe service is interesting for at least two reasons. It is often stated that a pressed-steel automobile chassis is not suitable for fire department service. The old car operated by this corps had a chassis exactly like the racing chassis of the locomobile that won the Vanderbilt cup some years ago. The chassis of the second car is so nearly like it that, except for the slight difference in size, no person not an expert can see any difference in it. Moreover, pneumatic tires are still retained, though some authorities say solid tires only should be used on fire apparatus. Officers of this company state that they do not see how high speed can be maintained with solid tires without injury to machinery and extreme discomfort to the men.

A DEMERIT SYSTEM FOR FIREMEN

Reasons for Abolishing Fining System and Advantages of Demerit System—Outline of System Proposed—Dismissals and Promotions

By Leonhard Felix Fuld, LL.M., Ph.D., Examiner of Municipal Civil Service Commission, New York.

THE writer believes that the system of fining firemen and policemen for violations of the rules and regulations of the department should be abolished for the following reasons:

1. Most of these men are either married men or have relatives dependent upon them for support and a fine results in hardship to perfectly innocent dependents of the officer, rather than in personal hardship to the officer himself.

2. The principal object of a disciplinary punishment is its deterrent effect. A fine has very little deterrent effect because it seldom results in personal hardship.

3. Firemen and policemen are paid a salary not as a reward but to enable them to feed, clothe and maintain themselves in a manner suitable to their station in life. The infliction of a fine prevents them from performing this function and thereby decreases their efficiency, when it has any personal effect upon them.

4. It is desirable that those men who are guilty of disciplinary offences be penalized therefor when they take a competitive examination for promotion, but it may be argued that it is unjust to punish a man twice for the same offence—first by depriving him of his pay and then again by lessening his chances for promotion.

5. A system of fines does not provide for the dismissal from the department of men who repeatedly violate the rules of the department. Such men are fined repeatedly and the effect of

these fines is that they become resentful, lose ambition and become practically worthless as members of the uniformed force.

6. Men who are fined frequently borrow money from those with whom they come into contact officially and this is detrimental to the service.

It is recommended that in lieu of the system of fining firemen and policemen for violations of the rules and regulations of the department the following system of demerits be established:

1. Whenever a man has been found guilty of a violation of the rules and regulations of the department after formal trial on charges duly preferred and proven against him, the judgment of the trial officer shall be that the man receives a specified number of demerits on his official record.

2. No man shall receive less than one demerit nor more than twenty-five demerits for any single charge or any number of charges growing out of the same occurrence.

3. For all purposes of official record a demerit shall be deemed the equivalent of a fine of one day's pay, but a man who receives a demerit shall not lose any pay.

4. A man's record of demerits shall consist of the demerits suffered by him during the last five years.

5. A man who has fifty demerits standing against him on his record at any time shall be dismissed from the service of the department.

6. No man shall be dismissed from the service of the department except as provided above or upon conviction for a criminal offence and imprisonment therefor.

7. A man shall be penalized for each demerit standing against him on his record when he takes an examination for promotion.

8. The head of department shall have power to suspend a man without pay pending his trial on charges preferred against him by proper departmental authority and also after a man has been indicted by the grand jury pending his trial by the criminal courts.

The following advantages of the demerit system are submitted for consideration:

1. The infliction of demerits will have a two-fold deterrent effect, since the demerits not only lessen the man's chances of promotion, but they also will result in his dismissal from the department if he receives fifty demerits within five years.

2. The infliction of demerits does not deprive the man of his ambition because after a period of five years has elapsed they will no longer be counted against him in any manner.

3. The infliction of demerits will not interfere in any way with the man's family or dependent relatives.

4. The infliction of demerits will not interfere in any way with the man's ability to support himself.

5. Under a system of demerits, a man will not be induced to borrow money from those with whom he comes into contact officially, in order to support himself.

6. If the men are demerited instead of being fined for violations of the rules and regulations it is perfectly proper to penalize them for such demerits when they take a promotion examination, without complaint being made that they are punished twice for the same offense

7. This system of demerits provides for the dismissal from the department of men who repeatedly violate the rules of the department. It is believed that the cumulative effect of this system of demerits will be found to have a most desirable disciplinary value.

8. Under the system of disciplinary punishments at present in force a man who has served the department for many years with a perfectly or a comparatively clear record is sometimes dismissed from the department for a single offense. A study of the court decisions would seem to indicate that many such dismissals have been reversed by the courts and it would seem also that no man with a good record ought to be dismissed for a single dereliction of duty unless this offense amounts to a crime of which he has been duly convicted and sentenced to prison by the machinery of the criminal law.

The disciplinary value of this system of demerits may be further increased by giving the least desirable assignments of duty to the men who have demerits standing against them on their records and by rewarding by means of desirable assignments and additional time off to those who have a perfectly clear record.

MOTOR APPARATUS AND FIRE LIMITS IN BOSTON

Percentage of Total Area in Fire Limits in Eight Large Cities—Auto Apparatus for Chief's Cars, Wrecking Wagon, Supply Wagons, Chemical Engines, Hose Wagons and Suburban Ladder Trucks—Comparative Cost and Efficiency

Under date of August 17th the Fire Commissioner of Boston, Mass., Charles D. Daly, submitted recommendations to the Mayor and city council embodying comprehensive additions to the fire department and considerable extension of the fire limits. These recommendations were accompanied with the commissioner's ideas concerning auto apparatus, and with reasons and arguments for the adoption of the measures recommended.

Concerning the extension of the fire limits, he stated that these remain at the present time unchanged since 1892, and comprise only 4.02 square miles out of a total land area of 38.5 square miles. Certain sections of the city have increased in population over 50 per cent. in the last ten years, while the increase throughout the entire city during that time has been about 20 per cent. Outside of the fire limits the construction has been largely of a kind designated by Commissioner Daly as "tinderbox." His desire would be to extend the fire limits to include the entire city; but he apparently realizes that this would be impracticable. He urged, however, immediate extension to include Charlestown, most of East Boston, South Boston, and all of the city proper as far as Heath Street, Columbus Avenue, Seaver Street and Columbia Road.

In order to prove that Boston is behind other cities in this matter he presented a table showing the total areas and the fire limit areas of eight of the leading cities of the country. Outside of Boston, where the fire limits embrace approximately 10 per cent. of the total land area, Cincinnati has the smallest relative area, a little under 12 per cent.; while Baltimore, Philadelphia, and St. Louis have extended these limits to about 50 per cent. of their total areas. Manhattan Borough alone is given under the head of New York, and practically the whole of this is included in the fire limits. If all the boroughs were included the showing of New York would be much less favorable in this respect.

Table of Building Limit Areas in the Leading Cities of the Country.

City.	Population, 1910.	Area, Sq. Miles.	Fire Limits. Sq. Miles.
Pittsburgh (entire)	588,905	40.67	8.61
Old City	.....	37.67	5.78 (1909)
Baltimore	588,485	31.65	15.2 (1909)
Boston	670,585	42.07	.....
		Land 38.5	4.02 (1905)
Philadelphia	1,549,008	129.58	68.0 (1905)
New York	2,410,250	21.93	*
Cincinnati	364,463	43.55	5.0 (1909)
Chicago	2,185,283	190.64	50.30 (1905)
St. Louis	687,029	61.37	31.45 (1905)

*Manhattan. Practically the entire area of the borough, 20 square miles.

Motor Apparatus

The subject of motor apparatus has apparently received careful consideration by Commissioner Daly, and the opinions which he has reached concerning the practicability of the various classes of motor apparatus and the desirability of adopting these for a large city are given in full as follows:

Recommendations.

This department has made a careful study of changing its horse-drawn apparatus to that of motor driven type. The present equipment of the Boston Fire Department has proven up to date an efficient fire stop for both down town and out of town fires. Any replacement of this apparatus necessitates changing from sure protection to untried apparatus whose efficiency under trying conditions may prove problematic. When it is considered that the value of the property protected is $1,400,000,000, and the number of people served is approximately 1,000,000 the seriousness of any change from present satisfactory conditions can be fully realized. No large city has as yet adopted any material amount of motor apparatus. Small cities, where the conflagration risk is neglected and, economy is the essential item, are its chief exponents. It has therefore been considered wise to recommend only such motor apparatus as has been tried and proven efficient under all conditions. After a complete investigation the following is recommended:

First.—The replacement of all district chiefs' buggies and the buggies of the superintendent of repairs and the superintendent of fire alarm by automobile runabouts. This involves fifteen horses and buggies.

Second.—The replacement of the present two-horse wrecking wagon and the two-horse supply wagons of the Fire Alarm Branch and the Repair Division by automobile combination wagons which will be duplicates of the chemical hose wagons and will constitute relief for the same. This will involve three wagons and six horses.

Third.—The replacement of the entire chemical engine equipment by automobile chemical hose wagons. This involves ten chemical engines and twenty horses.

Fourth.—The replacement of thirteen ordinary hose wagons by automobile chemical hose wagons of sufficient capacity to serve the high pressure system in future years if necessary. This involves thirteen wagons and twenty-six horses.

Fifth.—The replacement of four out-of-town ladder trucks by the same number of automobile ladder trucks. This involves four ladder trucks and twelve horses.

Sixth.—The replacement of two chemical engines by automobile ladder trucks. This involves two chemical engines and four horses.

Cost of Exchange.

This entire replacement involves the sale of eighty-three horses, twelve chemical engines, sixteen wagons, four trucks and eighty-three harnesses. Computed at the following prices, which could no doubt be obtained in exchange for new apparatus, the following amount would be received:

Horses, 83 at $150	$12,450
Chemical engines, 12 at $500	6,000
Wagons, 16 at $100	1,600
Buggies, 15 at $50	750
Harnesses, 83 at $5	415
Ladder trucks, 4 at $500	2,000
	$23,215

The necessary equipment to replace this apparatus would cost:

Combination hose wagons, 26 at $5,000	$130,000
Ladder trucks, 6 at $5,500	33,000
Runabouts, 15 at $1,750	26,250
	$189,250
	23,215
	$166,035

In order that the purchasing authority may have proper leeway for changes in plans, additions thereto, and changes in prices it would seem best to recommend that approximately $200,000 be made available for the carrying out of these recommendations.

Difference in Maintenance Expenditures.

To maintain one horse one year in the Boston Fire Department costs $250. This figure has been obtained by taking the approximate average expenditure for the maintenance of horses for the last five years. These expenditures are made up of bills for the following: Hay, grain, straw, shoeing, purchase and exchange of horses, harnesses and repairs, horse hire, attendants at hospital, medicines, etc.

There is considerable difficulty in estimating what would be the maintenance costs of motor equipment in this department. The maintenance costs of smaller cities and towns, in my opinion, are not reliable. They are based on smaller service mileage such as is not comparable with the work in Boston. Moreover, manufacturers of motor apparatus make many important repairs without cost at this time. It is reasonable to expect that later these repairs will not be free and will be numerous.

The cost of Motor Chemical 13 of this department for one year has been $338. This includes an expenditure of $100 for spare tires.

In my opinion the maintenance expenditures of motor chemical apparatus would not exceed $500, or the maintenance expenditures for horse drawn apparatus. It is possible that the charges would be somewhat less than $500, but considering the increase in repairs as the car depreciates, the heavy cost of repairs resulting from accidents, and the high cost of maintenance of pleasure cars, and the uncertainty with respect to depreciation, I do not feel that it would be safe to estimate any material and sure saving in maintenance over horse drawn apparatus. At the same time motor apparatus could unquestionably be maintained for not more than $500 per piece and there would probably be some saving.

It is not out of the question that this saving would amount to not less than $50 per horse, or $100 per team. In the case of the larger plan this would amount to $4,150 per year or the interest on about $103,750 at 4 per cent. In the case of the smaller plan a saving of $100 per team would amount to $2,250 per year, or the interest on about $56,000.

It is apparent that the services of drivers, who are paid $1,200 per year, would be available with motor apparatus.

Gain In Efficiency.

First.—The speed of horses responding to an alarm is from 12 to 15 miles an hour under the best conditions. The automobile will cover more than twice this distance in the same time if necessary.

Second.—It can cover a long distance with the same speed as short ones.

Third.—It is back in quarters quicker than horses and ready to respond to another alarm.

Fourth.—The services of the driver of an automobile are available, which is not so with the driver of horses.

Dorchester, with its large area of wooden buildings, and West Roxbury, rapidly building up in the same manner, needs just such fire service as automobile chemical hose wagons can give. Their speed will enable them in the case of single fires to reach the fires quicker and extinguish it in its incipiency. In the case of larger fires they will be enabled to cover long distances at great speed, which will be necessary when flying sparks travel from roof to roof.

Not Recommended.

It has not seemed wise to recommend the purchase of gasoline pumping engines for the following reasons:

First.—It has not yet been proven that the gasoline pumping engine can maintain a capacity of seven hundred gallons per minute for a material length of time.

Second.—The purchase of these enginees up to date have been in the nature of experiments. Boston with its heavy fire risk can not afford to experiment in any large degree with the most important part of its equipment, the pumping engine.

Third.—No large city has as yet done more than buy an experimental gasoline engine.

Fourth.—It is very questionable as to whether a motor drawn steam boiler, such as is in service in New York, may not prove a more satisfactory type than the single piece gasoline pumping engine and hose cart.

It is possible that later a gasoline driven engine may be perfected that will pump with reliability over 700 gallons and which will also carry 1,000 feet of hose and ten men. For the present I am of the opinion that there is no such engine. Should it be developed the economies possible will not be lessened by the adoption of these recommendations.

In my opinion the city should not proceed beyond the purchase of a single experimental engine which could be made from department funds.

On similar grounds no purchase of motor water towers or heavy ladder trucks should be made. Up to date there has been but one motor water tower in existence in this country, and that but a very short time. There are very few heavy motor ladder trucks. Considering the supreme necessity of maintaining the efficiency of these fire fighting machines, as well as the pumping engines, it seems wise to delay any action with respect to this apparatus for the present.

The commissioner also discussed the matter of Fire Department accounting and comparison of expenditures, which part of his report we will abstract in a later issue.

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SEPTEMBER 20, 1911

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Auto Fire Apparatus

SEVERAL interesting opinions of fire chiefs and other department officials concerning automobile fire apparatus are given elsewhere in this issue and the close agreement of these is somewhat remarkable. Not only these opinions, but those of the officials in other cities and the increasing numbers of auto apparatus purchased point to the general conclusion that motor propelled apparatus is more efficient than horse drawn. Almost the only question raised is as to the driving of fire pumps by internal combustion engines rather than by steam; and this is confined chiefly to the largest cities, where the conditions of service are most severe. It is probable, however, that even for service in small cities there remains more room for improvement in the auto engine than in either the hose wagon, chemical or combination wagon.

In the matter of economy the automobile apparatus offers much greater attraction to the small cities than to the large. For the small city and town, where the horses may receive food and lodging and the necessary attendance 20 or 30 days for every hour they are in service drawing fire apparatus, the economy of the automobile apparatus is undeniable. Even for Boston, however, a most conservative estimate places the total annual cost of the automobile apparatus fully as low as that of the horse drawn, with a reasonable doubt as to whether it might not be considerably lower. There would, therefore, seem to be good reason for the rapid increase in the numbers of such apparatus that are being purchased throughout the country. There will naturally be a delay on the part of many cities because of their disinclination to discard comparatively new horse-drawn apparatus, but there seems to be great probability that the time is not far distant when practically all of the new apparatus will be motor propelled, the horse-drawn apparatus being retained as a reserve or made over into automobile apparatus; and that the engine houses will no longer require considerable space and other provisions for the stabling of horses, which will not only permit a saving in cost but will also make the quarters less objectionable to the firemen occupying them.

Adapting Appliances to Conditions

THERE is a danger that some, especially non-experts such as councilmen, may fail to consider local conditions in criticising fire chiefs or fire departments, or comparing them with those of neighboring cities. Even fire chiefs and commissioners may sometimes commit this oversight. For example, both the amount and nature of apparatus required in a city abounding in steep hills may differ greatly from that best adapted to a flat city. It is apparent that the power of the motor drive for propelling the apparatus should be greater in the hilly city; it is possible that the number of pieces should be greater also. The location of fire houses should be carefully considered, one most favorably situated to use easy descending grades in reaching a large part of its territory being preferable to a location at the foot of the slope or at the top of a steeply descending street. A high-water pressure will generally require engines less in both number and power than will a low one. The greater the number of fire hydrants the less the amount of hose required for ample effectiveness.

These are some of the more apparent relations between local conditions and apparatus; but a careful study of one's own locality will show that there is hardly any condition directly or indirectly connected with fire fighting which should not be considered in a wise selection of apparatus, its housing and the fire fighting force.

London's Fire Losses

AN estimate of the monetary losses caused by fires in London from 1898 to 1911 has been submitted by the chief officer of the London fire brigade to the London County Council. The estimate does not cover the expenses incurred by insurance companies and others arising out of claims for damage resulting from fires, nor does it include any consequential losses which the owners of property may have sustained.

In 1910, for fires in which the loss did not exceed $243 in any case, the total damage done was $73,605; the loss for fires between $243 and $486 was $43,336; between $486 and $2,433, $212,178; between $2,433 and $4,866, $133,438; between $4,866 and $24,332, $623,398; over $24,332, $1,844,160; in all, $2,930,115.

The annual losses from 1898 to 1909, inclusive, are given as follows:

Years.	Loss.	Years.	Loss.
1898	$2,771,203	1904	$1,919,469
1899	2,259,165	1905	2,185,987
1900	2,507,945	1906	2,535,718
1901	3,196,579	1907	2,401,077
1902	3,951,792	1908	2,174,610
1903	1,950,852	1909	3,403,284

It will thus be seen that the total estimated loss for the 13 years amounts to $34,187,797, or an average annual fire loss of $2,629,830.

Considering the size of London, the fire losses appear to be very small, and this is accounted for by the fact that there are practically no frame buildings in London, that the warehouses and business premises generally are of slow-combustion construction, and that the dwelling houses are usually built of stone or brick, with a minimum amount of inflammable wood material. The humidity of the climate also tends very materially to keep down fire losses.—(*From report of U. S. Consul General John L. Griffiths, London.*)

FIRE DEPARTMENTS OF THE UNITED STATES

Data Furnished by the Fire Chiefs of Seven Hundred Cities and Towns—Amount and Kinds of Apparatus—Size of Force—Amount and Serviceable Life of Hose—Alarm Service

WE believe that the following tables contain more complete information of its kind concerning the fire departments of the United States than has ever before been collected. While there are a few cities which did not furnish the desired information, figures are given for more than 80 per cent of those credited with thirty thousand population by the latest census reports; and a considerable majority of the smaller places are represented. In studying the data it would perhaps be fair to assume that most of the chiefs who did not take the trouble to furnish the information asked are in general lax about the efficiency of their departments, and that the averages of the figures given therefore represent conditions somewhat bettr and more progressive than the average of those to be found in all the departments of the country.

These figures were all obtained directly from the chiefs of the respective departments, and are, therefore, presumably reliable. In certain cases questions were misunderstood, but an effort was made to detect these and correct the resulting errors. In a few cases there seemed to be unaccountable ignorance of matters which we assumed to be universal knowledge among fire chiefs, such as the National Standard hose coupling, and what is generally implied by the term "drill school"; such ignorance indicating, it would seem, failure to keep posted by reading the periodical literature provided for firemen and by attending the conventions, state and national, of the fire chiefs, such as that being held this week at Milwaukee. Such cases, however, were comparatively few.

These figures we have analyzed, and obtained totals and averages from them. While the departments listed contain all extremes of efficiency and of conditions and circumstances, there are so many in each class considered that the averages are believed to be fairly representative. In comparing any given department with these averages, consideration should of course be had of the respects in which it departs from average circumstances and conditions; whether the fire hydrants are unusually numerous, making it wise to keep less hose in service than in the average town; whether natural high gravity pressure renders pumping engines practically unnecessary, etc.

FIRE DEPARTMENTS OF THE UNITED STATES

Name of City.	Population.	Number on Force.		Hose Length in Feet.	Average Serviceable Life of Hose.	Is Coupling National Standard?	Is There a Drill School?	Alarms Still or Public.	Number of Alarm Boxes.	Wires in Business District Underground?
		Paid Men.	Call Men.							
Anniston, Ala.	16,000	3	*f*	6,000	3 to 5	No	..	Public	14	No
Bessemer, Ala.	11,000	5	12	4,000	5	No	No	Public	Telephone	No
Birmingham, Ala.	132,685	167	.....	45,000	3	Yes	No	Public	111	Yes
Eufaula, Ala.	6,000	3	30	3,500	10	Yes	No	.....	.....	.....
Montgomery, Ala.	39,000	65	..	12,000	4	Yes	.....	Both	67	No
Selma, Ala.	16,000	14	10	5,000	6 to 10	No	.....	Public	35	No
Sheffield, Ala.	4,900	2	10	1,800	.....	Yes	.....	Public	10	No
Talladega, Ala.	6,000	3	30	3,000	5	Yes	No	Public	.....	No
Bisbee, Ariz.	10,000	6	30*f*	7,500	5 to 6	.....	.....	Public	2	No
Douglas, Ariz.	8,000	5	13	2,500	3	Yes	.....	Public	20	No
Prescott, Ariz.	6,500	2*d*	60	4,500	.....	Yes	Drill once a month	Public	20	No
Eureka Springs, Ark.	5,000	.....	60	2,000	8 to 10	Yes	No	Public	Telephones	No
Fayetteville, Ark.	7,500	2	12	3,000	4	Yes	.....	Still	.....	No
Fort Smith, Ark.	26,000	28	None	10,000	4 to 6	Yes	No	Still	Telephone	.....
Helena, Ark.	8,557	6	.....	2,000	.....	No	Yes	Still	None	No
Hot Springs, Ark.	16,000	17	.....	6,500	4	Yes	.....	Public	23	No
Jonesboro, Ark.	10,000	2	10	2,000	4	Yes	.....	Both	.....	.....
Little Rock, Ark.	47,000	34	.....	7,000	4	No	.....	Both	39	Partly
Paragould, Ark.	6,000	1	11	1,000	5	Yes	.....	Public	.....	No
Pine Bluff, Ark.	25,000	12	.....	3,700	3½	Yes	Yes	Public	Telephone	No
Texarkana, Ark.	16,000	17	.....	8,000	4	Yes	Drill regularly	Public	40	No
Alameda, Cal.	24,000	24	32	8,000*h*	5	Yes	No	Both	45	No
Berkeley, Cal.	41,000	42	.....	9,000	5	Yes	Yes	Both	57	Yes
Eureka, Cal.	12,000	3–7*g*	250*f*	10,600	12 to 15	Mostly	No	Public	31	No
Fresno, Cal.	24,976	52	8	11,000	6 to 8	Yes	Yes	Public	37	No
Grass Valley, Cal.	6,000	.....	100	2,500	10	Yes	No	Public	13	No
Hanford, Cal.	8,000	5	30	3,300	4	Yes	.....	Public	19	No
Long Beach, Cal.	20,000	18	20	5,000	7	Pacific Coast Standard	No	Public	28	No
Los Angeles, Cal.	320,000	336	.....	76,925	3	Yes	Yes	Public	418	Yes
Marysville, Cal.	6,000	7	10	3,200	12	Yes	No	Public	19	No
Oakland, Cal.	175,000	135	99*g*	35,000	5 to 6	Yes	No	Public	200	Yes
Pasadena, Cal.	30,000	41	10	.....	.....	Very near	.....	Both	25	Yes
Pomona, Cal.	12,500	3	30	.....	10 to 14	Pacific Coast Thread	Monthly drill	Public	3	No
Redlands, Cal.	10,499	2	12	3,150	10	Yes	No	Public	None	Partly
Riverside, Cal.	15,000	9	20	.....	6	Yes	Yes	Telephone	28	No
San Francisco, Cal.	416,912	750	.....	100,000	5	Yes	Yes	Both	500	No. Being done now
San Luis Obispo, Cal.	6,000	4	12	2,400	10	Yes	.....	Both	15	No
Santa Barbara, Cal.	12,000	4	15	2,900	.....	Pacific Coast Standard	.....	Public	8	No
Santa Cruz, Cal.	12,000	6	14*g*–50*f*	4,000	10	Yes	.....	Public	12	No
Santa Monica, Cal.	1,400	7	24	4,000	4	Yes	No	Public	.....	No
Santa Rosa, Cal.	10,000	5	8*g*	4,000	7	Yes	Yes	Public	26	No
Boulder, Col.	11,000	11	.....	6,000	7	No	No	Still	15	Both
Colorado Springs, Col.	30,000	31	.....	2,000	.....	Yes	Yes	Still	61	No–soon
Denver, Col.	213,389	204	.....	46,350	4	No	Yes	Public	188	Yes
Grand Junction, Col.	8,000	4	6	3,500	5	No. Anderson	.....	Public	.....	Yes
La Junta, Col.	6,000	3	15	4,000	4	Yes	.....	Public	.....	No
Pueblo, Col.	45,000	49	.....	16,000	.....	No	.....	Public	82	Yes
Trinidad, Col.	14,000	5	6	3,200	10	Yes	No	Both	12	Yes
Ansonia, Conn.	15,140	.....	280*f*	7,000	8	Yes	No	Public	41	No
Danbury, Conn.	23,000	9–28*g*	175*f*	9,300	5	6 threads to inch	No	Both	40	No

d—Drivers. *f*—Volunteers. *g*—Partially paid. *k*—Paid $200 per year.

FIRE DEPARTMENTS OF THE UNITED STATES—(Continued)

Name of City.	Population.	Number on Force.		Hose Length in Feet.	Average Serviceable Life of Hose.	Is Coupling National Standard?	Is There a Drill School?	Alarms Still or Public.	Number of Alarm Boxes.	Wires in Business District Underground?
		Paid Men.	Call Men.							
Bridgeport, Conn.	102,054	132	10*k*	25,000	8	No	No	Public	230	Partly
Danielson, Conn.	4,500	.....	48	3,500	.....	7½ threads to inch	4 times a year	Public	11	No
Hartford, Conn.	108,000	154	.....	31,000	6	Yes	Yes	Public	170	Yes
Middletown, Conn.	10,000	7	150*f*	5,000	10	Yes	No	Public	22	No
New Britain, Conn.	50,000	25	60	10,000	.....	Yes	Yes	Public	72	Yes
New Haven, Conn.	133,605	172	.....	25,200	6	No	Yes	Public	238	Yes
Norwalk, Conn.	13,000	3*d*	*f*	25,000	.....	Yes	.....	Both	23	No
Norwich, Conn.	30,000	22	26–40*f*	10,900	10	Yes	No	Telephone	60	No
Putnam, Conn.	8,000	.....	67	3,500	6	Yes	No	Public	14	No
South Manchester, Conn.	14,000	.....	150	4,500	5	No	No	Both	25	No
South Norwalk, Conn.	10,000	4	150	4,000	.....	Yes	.....	Public	32	No
Southington, Conn.	6,000	.....	115	3,500	6	No	.....	Public	21	No
Stamford, Conn.	25,138	29	14	5,750	8	Yes	No	Public	54	Partly
Wallingford, Conn.	11,000	.....	75	2,400	15	Yes	.....	Public	24	No
Waterbury, Conn.	73,142	71	.....	13,600	10	No	Yes	Public	92	No
West Haven, Conn.	10,000	2	120	5,600	4 to 6	Yes	No	Public	35	No
Willimantic, Conn.	11,280	.....	130	4,200	10	No	No	Both	29	No
Washington, D. C.	331,069	473	None	76,500	7	No	Yes	Public	521	Yes
Smyrna, Del.	2,200	.....	35	2,000	.....	Yes	.....	Public	.....	.....
Daytona, Fla.	6,000	.....	14	2,000	.....	Yes	.....	Telephone	.....	No
Fernandina, Fla.	5,000	3	15	2,000	4	No	.....	Public	11	No
Gainesville, Fla.	8,000	2	30	2,000	5	Yes	.....	Public	20	No
Jacksonville, Fla.	60,000	78	.....	16,000	5	No	No	Still	101	No
Ocala, Fla.	7,000	5	.....	3,500	5	Yes	No	Public	Telephone	No
Orlando, Fla.	6,000	1	15	6,000	6	.....	No	Public	10	No
Palatka, Fla.	5,750	.....	43*f*	2,500	5	Yes	No	Public	None	No
St. Augustine, Fla.	5,000	5	10	2,000	.....	Yes	.....	Public	24	No
Tampa, Fla.	50,000	45	.....	13,000	4	No	No	Still	55	Yes
Albany, Ga.	10,000	7	.....	5,000	10	Yes	No	Public	22	No
Athens, Ga.	17,000	18	1	4,000	3	No. 8 threads to inch	No	Public	37	No
Atlanta, Ga.	154,800	200	.....	25,000	5	No. Atlanta Thread	Yes	Public	117	Yes
Bainbridge, Ga.	8,000	4	2	2,500	7	Yes	No	.....	Telephone	No
Brunswick, Ga.	10,000	10	.....	3,500	5	Yes	No	Public	30	No
Columbus, Ga.	25,000	38	.....	12,000	5	No	No	Public	32	Partly
Dawson, Ga.	5,000	4	10	4,000	5 to 8	.....	.....	Public	.....	.....
Dublin, Ga.	5,795	11	7*b*	4,000	5	Yes	.....	Public	25	No
Elberton, Ga.	6,483	1	10	2,500	5	.....	.....	Public	5	No
Fitzgerald, Ga.	5,795	5	5	2,500	5 to 7	Yes	Daily with horses and paid men whole dept. once a month	Public	Telephone	No
Griffin, Ga.	10,000	11	30	5,000	10	Yes	.....	Both	16	No
Hawkinsville, Ga.	3,800	3	22	1,400	4	Yes	No	Both	3	No
La Grange, Ga.	6,000	3	4	2,250	.....	.....	.....	.....	Telephone	.....
Macon, Ga.	35,000	70	.....	12,500	3 to 10	No. 8 threads to inch	No. Drill Weekly	.....	73	Yes
Newnan, Ga.	5,500	4	.....	2,500	5	Yes	None	Public	12	No
Rome, Ga.	16,300	24	6	8,450	9	No	No. Weekly Drill	Public	47	Yes
Savannah, Ga.	75,000	100	.....	15,950	4 to 5	No	No	Public	102	Yes
Thomasville, Ga.	7,000	5	.....	3,000	4 to 6	Yes	No	Telephone	None	No
Tifton, Ga.	3,500	.....	12	2,000	3	No	No	None	None	.....
Waycross, Ga.	14,485	5	8	3,500	5	Yes	No	Telephone	.....	No
Boise, Idaho	30,000	23	.....	6,250	.....	No	Drill 3 times a week	Both	10	No
Lewiston, Ida.	6,050	3	65	3,900	5½	Yes	.....	Public	27	No
Aurora, Ill.	30,000	30	.....	8,500	8	.....	No	Still	105	Partly
Beardstown, Ill.	6,300	.....	18*f*	2,100	12	Yes	No	Telephone	.....	No
Bloomington, Ill.	27,350	31	None	6,000	7	Yes	Drill once a week	Public	51	No
Blue Island, Ill.	9,000	2	30	3,300	6	Yes*l*	No	Public	24	No
Canton, Ill.	11,500	8	3	4,000	.....	Yes	No	Public	Telephone	No
Carlinville, Ill.	3,800	.....	13	1,300	12 to 15	Yes	Yes	Public	.....	No
Champaign, Ill.	14,000	5	14	2,800	10	Yes	Yes	Public	None	Yes
Charleston, Ill.	6,500	3	7	.....	5	No	.....	Public	.....	.....
Chicago, Ill.	2,185,283	1,800	41	299,090	6	Yes	No	Still	1,932	Yes
Clinton, Ill.	6,500	1	20	1,400	4	Yes	No	Still	None	No
Danville, Ill.	28,475	37	.....	7,500	5	Yes	.....	Still	66	No
DeKalb, Ill.	9,500	7	.....	3,500	10	Yes	.....	Both	30	No
Dixon, Ill.	10,000	4	.....	3,100	.....	Yes	.....	.....	.....	.....
Du Quoin, Ill.	5,500	.....	10	1,200	.....	.....	.....	Public	None	No
East St. Louis, Ill.	60,000	65	.....	11,000	.....	Yes	.....	Both	43	No
Elgin, Ill.	26,000	26	.....	5,250	6	Yes	.....	Public	80	Yes
Evanston, Ill.	29,800	35	.....	7,600	10	No. Chicago Thread	Yes	Still	43	Yes
Galena, Ill.	6,000	.....	125*f*	2,500	5	Yes	.....	Public	None	.....
Galesburg, Ill.	23,000	21	.....	5,000	5	No	Yes	Telephone	.....	Yes
Harvey, Ill.	7,000	4	24	3,100	7	No	No	Both	23	No
Joliet, Ill.	36,000	37	.....	8,000	7	No	No	Both	123	Yes
Kewanee, Ill.	18,000	5	12	3,000	5	No	.....	Public	4	No
Lincoln, Ill.	10,892	3	15	2,000	6 to 7	No	No	Public	Telephone	Part
Macomb, Ill.	7,000	1	7*g*	1,700	5	Yes	.....	Public	33	No
Marion, Ill.	10,000	2	8	750	.....	Yes	No	Still	None	No
Mattoon, Ill.	14,000	7	1	1,800	6	Yes	No	Public	Telephone	No
Metropolis, Ill.	5,000	8	8	.....	10	Yes	.....	Public	.....	No
Moline, Ill.	25,348	27	.....	7,500	8	Yes	No	Public	86	Yes
Monmouth, Ill.	9,867	7	81	3,900	8	No	No	Public	15	No
Mt. Vernon, Ill.	10,000	8	.....	1,000	4	Yes	.....	Public	10	No
Murphysboro, Ill.	12,000	3	None	1,700	4 to 6	Yes	No	Telephone	None	No
Oak Park, Ill.	19,864	13	.....	3,200	7	No	Drill once a week	Still	25	No
Peoria, Ill.	66,950	82	.....	21,000	4	Yes	No	Both	168	Yes
Pontiac, Ill.	6,100	8	3	2,300	10	Yes	None	Public	23	No
Rockford, Ill.	47,000	65	.....	11,000	7	Yes	Yes	Still	78	Yes
Sterling, Ill.	9,000	5	6	3,500	6 to 8	Yes	Drill every two weeks	Both	18	No

b—Paid. *d*—Drivers. *f*—Volunteers. *g*—Partially paid. *k*—Paid $200 per year. *l*—Changing to the National Standard.

FIRE DEPARTMENTS OF THE UNITED STATES—(Continued)

Name of City.	Population.	Number on Force.		Hose Length in Feet.	Average Serviceable Life of Hose.	Is Coupling National Standard?	Is There a Drill School?	Alarms Still or Public.	Number of Alarm Boxes.	Wires in Business District Underground?
		Paid Men.	Call Men.							
Streator, Ill.	17,000	10	.....	4,050	3	Yes	No	Public	25	No-soon
Taylorville, Ill.	7,000	3	5	1,500	5	Yes	Yes	Public	None	.....
Urbana, Ill.	9,000	3	12	2,000	8	No	.....	Public	None	No
Woodstock, Ill.	5,000	.....	25	1,200	.....	Yes	.....	Public	20	No
Anderson, Ind.	25,000	23	.....	6,500	6	No	.....	Public	74	Yes
Bluffton, Ind.	5,000	(*d*)	13	2,200	10	Yes	.....	None	No	
Boonville, Ind.	6,000	1	(*f*)	2,000	.....	.....	No	Still	Telephone	.....
Brazil, Ind.	10,000	5	6	2,100	5	Yes	.....	Public	16	No
Connersville, Ind.	11,000	10	6	6,000	10	Yes	No	Public	29	No
Elkhart, Ind.	20,000	26	.....	9,500	12	Yes	No	Public	42	No
Elwood, Ind.	12,000	8	10	2,500	7	Yes	.....	Public	19	No
Evansville, Ind.	80,000	85	.....	20,000	5 to 8	No 7½ threads to inch	No	Both	85	No
Frankfort, Ind.	9,000	6	.....	2,000	.....	Yes	.....	Public	Telephone	No
Greenfield, Ind.	6,000	.....	12	3,000	6 to 9	Yes	No	Telephone	.....	No
Hammond, Ind.	21,000	33	.....	7,000	.....	.....	No	Still	35	Partly
Huntington, Ind.	12,000	11	.....	4,000	5	No	.....	Public	38	No
Indianapolis, Ind.	233,000	285	.....	42,000	6	No	.....	Both	300	Yes
Lafayette, Ind.	20,100	24	.....	6,000	8	Yes	No	Public	45	No
La Porte, Ind.	10,500	15	.....	5,750	7	No	.....	Public	30	No
Logansport, Ind.	19,500	20	.....	5,000	7 to 8	No	.....	Public	58	No
Marion, Ind.	20,000	24	30	14,000	10	No	No	Both	45	No
Michigan City, Ind.	2,200	17	26	7,000	5	Yes	Drill once a week	Public	37	No
Montpelier, Ind.	3,000	.....	25	2,500	6	No	No	Public	None	No
Mt. Vernon, Ind.	6,562	.....	10	1,600	6	Yes	No	Public	Telephone	No
Muncie, Ind.	32,000	23	.....	6,000	5	No	Yes	.....	49	No
North Vernon, Ind.	4,000	1	20	1,500	10	Yes	Yes	Still	4	No
Peru, Ind.	10,910	8	.....	3,500	.....	.....	Drill weekly	Public	.....	Partly
Plymouth, Ind.	5,000	.....	64*f*	2,500	3	Yes	No	Public	Telephone	No
Portland, Ind.	5,000	3	10	2,000	5	Yes	.....	Public	Telephone	Partly
Richmond, Ind.	23,223	26	.....	8,500	15	Yes	No	Public	62	Yes
Shelbyville, Ind.	1,050	17	.....	3,000	8	No	.....	Public	34	No
Tell City, Ind.	4,000	29	.....	2,800	3 to 5	Yes	No	Public	None	No
Terre Haute, Ind.	60,000	76	.....	14,000	5 to 6	No 7 threads to inch	No	Both	105	.....
Valparaiso, Ind.	8,000	2	15	1,500	5	Yes	No	Public	35	No
Vincennes, Ind.	15,000	15	.....	3,500	10	No	No	Public	42	No
Washington, Ind.	10,000	8	.....	2,500	5 to 7	Yes	Drill once a day	Public	27	No
Winchester, Ind.	5,000	3	10	2,200	7	Yes	.....	Public	.....	.....
Albia, Iowa	5,000	2	28*f*	1,500	.....	Anderson	.....	.....	Telephone	No
Algona, Iowa	3,000	.....	20*f* 3	1,375	15	Yes	Yes	Public	.....	Partly
Burlington, Iowa	25,000	16	6	12,000	6	No	Yes	Public	42	Yes
Cedar Rapids, Iowa	32,821	31	.....	7,600	10	No	Yes	Both	51	No
Charles City, Iowa	6,500	1	19	2,600	8	Yes	No	Public	None	No
Creston, Iowa	7,500	3	50*f*	2,000	.....	Yes	.....	Public	.....	No
De Moines, Iowa	86,368	106	.....	25,000	8	No	No	Still	129	Yes
Dubuque, Iowa	39,000	44	.....	11,110	5	Yes	.....	Public	58	No
Fort Dodge, Iowa	15,543	5	44	4,500	8	Yes	No	Public	13	No
Fort Madison, Iowa	10,000	.....	140*f*	7,500	5	No	.....	Public	.....	.....
Grinnell, Iowa	5,500	.....	50	2,500	6	Yes	.....	Public	.....	No
Iowa City, Iowa	11,000	1*d*	70	4,000	.....	Yes	.....	Both	15	No
Marion, Iowa	4,600	3	147*f*	2,000	6	Yes	.....	Public	14	.....
Marshalltown, Iowa	14,000	11	.....	4,000	10	Yes	.....	Both	23	No
Mason City, Iowa	13,000	8	4	3,000	10	No	Yes	Still	6	No
Muscatine, Iowa	17,000	.....	500	5,000	.....	Yes	.....	Public	None	Yes
Sioux City, Iowa	48,000	44	.....	12,000	10	No	No	Still	66	No
Waterloo, Iowa	26,000	21	.....	4,650	.....	Yes	.....	Public	31	No
Atchison, Kan.	18,000	13	.....	4,500	8	No	.....	Public	Telephone	Yes
Coffeyville, Kan.	18,000	9	.....	3,200	14	Yes	Drill once a month	Public	Telephone	Partly
Girard, Kan.	3,000	10	5	1,400	5	Yes	Weekly	Public	.....	No
Hutchinson, Kan.	17,000	9	.....	4,000	6	Yes	.....	Public	Telephone	Partly
Independence, Kan.	12,000	6	.....	2,000	.....	Yes	.....	Public	Telephone	Partly
Kansas City, Kan.	100,000	62	.....	15,000	7	.....	No	.....	Telephone	No
Lawrence, Kan.	14,000	3	12	3,500	8	Partially	.....	Public	None	No
Leavenworth, Kan.	22,000	14	.....	5,000	8	No	.....	Public	.....	Yes
Manhattan, Kan.	6,000	2	8	2,300	5	Yes	.....	Public	.....	.....
Newton, Kan.	9,000	3	3	3,500	.....	Yes	.....	Still	Telephone	No
Ottawa, Kan.	10,000	2	25	2,800	5	No	.....	Public	28	No
Parsons, Kan.	16,000	10	.....	4,500	6	Yes	Drill twice a month	Public	24	No
Salina, Kan.	10,000	6	12	3,000	15	Anderson	No	.....	Telephone	No
Topeka, Kan.	52,000	53	.....	9,450	5 to 7	Yes	No	Both	67	No
Winfield, Kan.	8,000	3	6	2,000	10	Yes	No	Telephone	None	Yes
Ashland, Ky.	8,635	5	12	3,500	7	Yes	No	Both	2	No
Bellevue, Ky.	7,500	1	3	800	15	Yes	No	Still	15	No
Bowling Green, Ky.	11,675	11	.....	3,500	6	No	No	Both	17	No
Covington, Ky.	53,270	51	.....	12,200	.....	Yes	.....	Public	106	No
Cynthiana, Ky.	5,000	.....	36*f*	1,000	.....	Yes	No	.....	0	No
Danville, Ky.	6,000	2	20	2,000	2	Yes	No	Public	1	No
Frankfort, Ky.	14,000	4	.....	2,300	4	Yes	.....	Public	23	No
Lexington, Ky.	35,099	40	.....	9,500	5	No	None	Public	62	No
Louisville, Ky.	224,000	260	34*i*	34,000	5	No	None	Both	366	Yes
Newport, Ky.	30,309	12	.....	4,700	14	Yes	Drills	Public	45	Soon
Paducah, Ky.	30,000	40	.....	10,000	7	No	Yes	Public	88	No
Richmond, Ky.	5,000	2	12	3,000	5	Yes	.....	.....	.....	No
Shelbyville, Ky.	3,500	4	12	1,200	.....	No	.....	Public	8	No
Somerset, Ky.	5,000	.....	30	1,600	5	Yes	No	Public	None	No
Baton Rouge, La.	20,000	5	200	3,000	5	No	No	Public	25	No
Crowley, La.	5,500	2	35	3,000	2	Yes	.....	Public	18	.....
Donaldsville, La.	5,000	.....	100*f*	2,000	.....	.....	Yes	Public	12	No
New Orleans, La.	339,075	409	.....	47,133	5 to 7	No	No	Both	323	Yes
Opelousas, La.	6,000	2	25	2,700	10	Anderson	.....	Public	.....	No
Shreveport, La.	30,000	37	2	10,000	5½	Yes	Yes	Public	49	No
Auburn, Me.	16,000	3	37	9,000	7	Yes	No	Public	32	No
Biddeford, Me.	19,000	6	37	8,000	8	No	No	Public	27	No
Calais, Me.	8,000	3	25	5,000	4	Yes	.....	Public	16	No
Eastport, Me.	6,000	33	....	3,000	3 to 4	Yes	.....	Public	15	No
Gardiner, Me.	6,000	126	123	8,000	.....	Yes	No	Public	Telephone	No

d—Drivers. *f*—Volunteers.

FIRE DEPARTMENTS OF THE UNITED STATES—(Continued)

Name of City.	Population.	Number on Force.		Hose Length in Feet.	Average Serviceable Life of Hose.	Is Coupling National Standard?	Is There a Drill School?	Alarms Still or Public.	Number of Alarm Boxes.	Wires in Business District Underground?
		Paid Men.	Call Men.							
Portland, Me.	55,000	76	141	20,000	8	No	No	Both	180	Partially
Rockland, Me.	8,500	.....	48	5,500	7	Yes	.....	Public	17	No
Rumford, Me.	7,000	3	90	6,000	.....	.....	None	Public	21	No
Saco, Me.	6,500	3	38	4,400	3	.....	.....	Public	None	No
Waterville, Me.	12,000	5	63	8,000	6	Yes	No	Public	28	Yes
Annapolis, Md.	10,000	.....	(f)	3,500	6	Yes	.....	Public	None	No
Baltimore, Md.	700,000	748	50i	135,850	6 to 7	No	No	Public	681	Yes
Cumberland, Md.	23,000	20	.....	6,500	10	Yes	Daily drill	Both	24	No
Adams, Mass.	14,000	.....	40	5,300	12	Yes	No	Public	32	No
Amherst, Mass.	5,500	.....	40a	6,000	6	8 threads	.....	Public	20	No, but expect to in less than 1 year
Andover, Mass.	7,000	.....	28	5,000	.....	Yes	.....	Public	37	No
Attleboro, Mass.	17,560	11	92	10,000	8 to 10	Yes	.....	Public	68	No
Beverly, Mass.	19,000	18	124	12,000	2	Yes	No	Public	73	No
Boston, Mass.	650,000	.....	.....	122,503	4	No, Roxbury coupling	Yes	Both	755	Yes
Bridgewater, Mass.	7,000	.....	40	4,000	5 to 7	Yes	No	Public	22	No
Brockton, Mass.	57,000	59	29	17,000	9	Yes	No. Monthly drills	Public	120	Yes
Brookline, Mass.	30,000	82	10	14,000	10	Yes	Yes	Public	70	Yes
Cambridge, Mass.	104,000	92	46	16,600	10	Yes	No	Public	181	No
Chelsea, Mass.	39,000	24	62	10,150	8 to 9	Yes	No, each captain drills his men monthly	Public	54	Yes
Chicopee, Mass.	26,000	12	78	12,000	5	No, clutch	No	Public	52	No
Concord, Mass.	7,000	.....	50	3,000	4 to 5	Roxbury thread	Monthly drills	Public	20	No
Everett, Mass.	33,000	24	23b	7,000	5 to 8	Yes	No	Public	65	No
Fall River, Mass.	119,000	125	29	21,000	10	No	Yes	Both	203	Yes
Fitchburg, Mass.	38,000	30	69	14,000	8 to 10	Yes	No	Public	86	Small part underground
Franklin, Mass.	6,000	.....	85b	4,200	8 to 10	Roxbury thread	No	Public	15 outside stations	No
Gloucester, Mass.	28,000	20	155	16,500	6	No	No	Public	61	No
Great Barrington, Mass.	6,000	.....	28	2,500	8	No. 8 threads	No	Public	10	No
Greenfield, Mass.	11,000	2	50	5,500	3 to 4	Yes	No	Both	40	No
Haverhill, Mass.	44,115	29	50	14,750	5	No	No	Both	68	Yes
Hingham, Mass.	6,000	1	100	5,000	.....	Yes	No	Public	35	No
Holyoke, Mass.	58,000	78	10	24,000	6	No, clutch or universal	No	Public	138	No
Lawrence, Mass.	85,000	64	57	19,500	5	Yes	No	Public	124	Mostly all
Lee, Mass.	4,000	4	137f	6,400	5	No	No	Public	None	No
Lowell, Mass.	106,294	117	69	21,000	8 to 16	No	Each company drills every month in warm weather	Both	144	Yes
Lynn, Mass.	90,000	87	54	16,000	7	No	No	Public Gamewell Central Office	141	Not all
Malden, Mass.	45,000	40	25	12,500	8	Yes	No	Public	104	Yes
Marblehead, Mass.	7,500	5	40	7,000	6	Yes	.....	Both	43	Part
Marlborough, Mass.	16,000	5d	55	8,500	4 to 7	Yes	No, monthly practice	Both	42	Doing so now
Medford, Mass.	25,000	14	46	8,500	8 to 10	No	No	Public	52	No
New Bedford, Mass.	110,000	75	142	17,000	3	No, 7 to inch 3 1-16 O.D.	No	Public	143	Yes
Newton, Mass.	39,806	39	53	17,650	10	No, Roxbury thread	No	Public	158	Yes
Orange, Mass.	.....	None	40	6,000e	15	No, 7 threads to inch	No, practice once a month	Public	22	No
Peabody, Mass.	16,000	10	88	15,000	7 to 10	Yes	.....	Public	55	No
Quincy, Mass.	32,624	22	64	12,000	4	Yes	No	Both	120	Partly
Reading, Mass.	6,000	56	6	7,000	10	Yes	No	Public	44	No
Revere, Mass.	18,000	12	46	8,000	.....	Yes	No	Both	56	No
Somerville, Mass.	77,236	64	40	10,500	9	Yes	No	Public	118	Yes
Springfield, Mass.	90,000	146	12	25,000	9	Yes	Yes	Public	.....	Yes
Swampscott, Mass.	5,141	7	36	4,000	9	Yes	No	Public	29	No
Taunton, Mass.	35,000	28	60	14,000	15	Yes	No	Public	129	No
Turners Falls, Mass.	5,500	32	32	5,000	3	No	No	Public	16	No
Wakefield, Mass.	11,200	5	45	6,000	8 to 10	No	No	Public	44	No
Waltham, Mass.	28,000	19	64	10,500	10	Roxbury thread	No	Both Gamewell fire alarm	87	Some
Watertown, Mass.	13,000	4	30	6,000	5	Yes	.....	Public	40	Yes
Webster, Mass.	11,509	.....	65	5,000	4 to 5	Yes	No	Public	28	No
Wellesley, Mass.	8,000	.....	35	4,500	10	Yes	No	Public	43	No
Winthrop, Mass.	11,000	8	40	7,000	8	Yes	No	Public	46	Conduits are in
Woburn, Mass.	15,400	5	60	14,500	5	Yes	.....	Public	53	No
Worcester, Mass.	150,000	175	38	33,000	7	Yes	Yes	Both	270	Yes
Adrian, Mich.	12,000	6	20g	10,000	.....	Yes	.....	Public	25	Yes
Alpena, Mich.	13,500	9	14	7,600	8	.....	No	Public	14	No
Ann Arbor, Mich.	20,000	20	.....	6,000	.....	Yes	Yes	Telephone	.....	No
Battle Creek, Mich.	25,000	32	3	8,500	10 to 20	Yes	.....	Public	91	Partly
Bay City, Mich.	50,000	34	30	23,700	4 to 8	8 threads to the inch	No	Public	149	Yes
Cadillac, Mich.	9,000	2-1g	20	6,900	10	Yes	No	Both	24	No
Charlotte, Mich.	5,000	4	18	2,400	6	Yes	No	Public	15	No
Flint, Mich.	38,000	24	1	9,000	.....	No	Drill	Public	34	No
Grand Haven, Mich.	6,000	1	23	4,000	10	Yes	No	Public	22	Partly
Grand Rapids, Mich.	113,000	157	.....	31,610	13	Yes	Yes	Both	217	Yes
Hancock, Mich.	10,000	16	.....	3,000	.....	.....	No	Public	22	Yes
Hastings, Mich.	5,000	1	20	3,500	5	Yes	.....	Public	25	.....
Holland, Mich.	11,000	10	24	7,000	8	Yes	No	Public	32	No

a—Callmen paid $40 yearly. b—Paid. c—Paid $250 per year. d—Drivers. e—Also 2,000 ft. inferior hose. f—Volunteers. g—Partially paid. i—Substitutes.

FIRE DEPARTMENTS OF THE UNITED STATES—(Continued)

Name of City.	Population.	Number on Force.		Hose Length in Feet.	Average Serviceable Life of Hose.	Is Coupling National Standard?	Is There a Drill School?	Alarms Still or Public.	Number of Alarm Boxes.	Wires in Business District Underground?
		Paid Men.	Call Men.							
Houghton, Mich.	7,500	16	8	3,500	10 to 12	Yes, 7½ threads to inch	.....	Public	21	No
Ironwood, Mich.	14,000	4-1g	58	7,000	10	Yes	No	Public	32	No
Kalamazoo, Mich.	40,000	48	.....	10,000	8	Yes	Yes	Public	48	Yes
Lansing, Mich.	35,000	31	.....	7,000	7	Yes	Yes	Public	75	Yes
Laurium, Mich.	8,000	.....	18	3,000	10	Yes	.....	Both	7	No
Ludington, Mich.	10,000	27	.....	5,500	10	Yes	No	Public	16	Yes
Manistique, Mich.	5,000	3	12	3,400	12	Yes, 2½ in.	.....	Public	Telephone	No
Menominee, Mich.	13,000	15	.....	4,500	8 to 10	No	No	Public	80	No
Monroe, Mich.	8,000	2	22	4,000	12	Yes	.....	Still	Telephone	No
Mt. Pleasant, Mich.	5,000	1	11	3,000	.....	Yes	.....	Public	12	No
Muskegon, Mich.	25,000	21	21	12,000	10	No	No	Public	44	No
Norway, Mich.	4,800	3	14	2,000	10	No	.....	.....	25	No
Owosso, Mich.	9,639	7	4	4,600	10 to 12	Yes	Yes	Public	28	No
Pontiac, Mich.	14,680	13	5	4,000	7	Yes	Drill each evening	Public	87	No–soon
St. Clair, Mich.	2,700	.....	30	2,500	.....	Yes	.....	Public	15	No
St. Joseph, Mich.	6,000	4	14	3,000	12	No	.....	Public	None	Part
Saginaw, Mich.	55,000	51	5	23,000	8	.....	No	Public	100	Yes
South Haven, Mich.	4,500	11	(f)	2,500	4 to 6	Yes	Drill	Public	Telephone	No, not all
Traverse City, Mich.	12,000	8	46	5,000	5	No	.....	Both	42	No
Albert Lea, Minn.	6,192	.....	25	3,000	.....	Yes	No	Public	Telephone	Yes
Alexandria, Minn.	3,001	.....	60	2,500	6 to 8	Yes	No	Public	None	.....
Anoka, Minn.	4,500	3	17	4,000	10	Yes	.....	Public	20	No
Austin, Minn.	8,000	1	39	4,200	12	7 threads	.....	Public	18	No
Bemidji, Minn.	6,000	1	37	3,000	7	No	Yes	Public	.....	No
Cloquet, Minn.	7,031	8	25	4,200	.....	St. Paul Stan.	Drill every day	Both	16	No
Crookston, Minn.	8,000	2	22	4,000	7	7½ to the inch	.....	Public	5	Yes
Ely, Minn.	3,500	.....	35	4,500	5 to 8	Yes	Yes	Public	18	No
Eveleth, Minn.	7,000	10	10	3,500	10	Yes	Yes	Public	28	Yes
Faribault, Minn.	9,001	12	50	2,700	.....	Yes	No	Public	.....	Yes
Hastings, Minn.	4,000	.....	20	2,500	5	Part	No	Public	None	No
Mankato, Minn.	10,500	7	80	6,000	6	Yes	Drills at Central Station	Both	19	Partially
Minneapolis, Minn.	315,000	400	.....	58,000	3 to 5	No	No	Public	393	Yes
New Ulm, Minn.	5,600	1	50f	3,000	8 to 12	Yes	Drill once a month	Public	24	No
Owatonna, Minn.	6,500	6	15	2,800	6	Yes	Yes	Public	17	No
Red Wing, Minn.	9,500	9	30	6,500	12	Yes	Yes	Public	32	Partly
Rochester, Minn.	8,000	2	25	4,000	10	Yes	No	Public	19	Partly
St. Cloud, Minn.	10,600	4	19	2,200	2	.....	No	Public	18	No
St. Paul, Minn.	215,000	297	.....	60,000	.....	No	Yes	Both	260	Yes
Stillwater, Minn.	10,200	8	3	5,000	6	Yes	No	.....	29	No
Two Harbors, Minn.	5,000	2	18	2,500	2	Yes	Drill twice a month	Public	None	Partly
Willmar, Minn.	4,000	.....	50	2,200	10	Yes	.....	Telephone	.....	.....
Winona, Minn.	23,000	31	.....	8,000	10 to 20	No	Yes	Still	60	No
Aberdeen, Miss.	4,000	2	6	2,000	5	No	.....	.....	Telephone	No
Jackson, Miss.	21,262	34	.....	6,600	5	Yes	No	Public	32	No
Meridian, Miss.	25,000	32	6	13,000	4 to 8	Yes	.....	Public	35	No
Natchez, Miss.	12,000	5	(f)	12,000	5	Yes	.....	Public	Telephone	No
West Point, Miss.	5,000	2	12	2,000	.....	Yes	.....	Still	.....	No
Yazoo City, Miss.	10,000	10	.....	4,500	7	Yes	.....	Public	20	No
Aurora, Mo.	5,000	1	16g	1,000	10	Yes	.....	Public	None	.....
Brookfield, Mo.	6,000	2	10	2,500	.....	Yes	.....	Telephone	.....	No
Cape Girardeau, Mo.	10,000	3	12	1,400	3 to 4	Yes	Drill once a month	Still	17	No
Carthage, Mo.	9,416	6	.....	3,000	8	Yes	.....	Public	Telephone	No
Clinton, Mo.	5,059	3	8	2,300	5	Yes	None	Public	None	No
Columbia, Mo.	10,000	.....	18	3,000	.....	Yes	.....	Telephone	.....	No–soon
DeSoto, Mo.	5,000	12	18	1,800	5 to 8	Yes	.....	Still	.....	No
Fulton, Mo.	5,500	12	4	2,000	7	Yes	.....	Public	Telephone	.....
Hannibal, Mo.	20,000	9	5	4,000	4	No	No	Telephone	None	No
Kansas City, Mo.	248,381	300	.....	43,000	3½	No. Fehy.	Yes	Telephone	.....	Yes
Kirksville, Mo.	8,000	1d	9	2,000	5	Yes	.....	Public	None	No
Mexico, Mo.	6,500	1	8	1,800	10 to 12	No. Anderson	Once a month	Public	None	No
Poplar Bluff, Mo.	12,000	2	10	3,000	2	Yes	Yes	.....	None	No
St. Charles, Mo.	10,000	4	36	3,500	.....	Yes	.....	Public	15	No
St. Louis, Mo.	690,000	788	.....	120,000	3	Yes	No	Still	1,380	Yes
Springfield, Mo.	40,000	23	.....	7,000	5	Yes	Ladder practice	Public	62	No
Warrensburg, Mo.	6,000	1	6	3,000	20	Yes	No	Still	.....	No
Billings, Mont.	11,000	11	20	5,200	6	Yes	No	Public	11	No
Bozeman, Mont.	6,000	3	45f	3,000	8	Yes	Yes	Public	20	No
Helena, Mont.	15,000	9	10g	4,000	10	7 threads to inch	No	Both	36	No
Kalispell, Mont.	6,500	2	35	2,200	10	Yes. 7½ threads	.....	Public	None	No
Missoula, Mont.	12,800	11	30	4,800	3	Yes	No	Public	None	Some
Red Lodge, Mont.	5,000	2	20	2,400	4	Yes	.....	Public	None	No
Beatrice, Nebr.	10,000	4	150f	4,000	8	Yes	None	Public	None	No
Columbus, Nebr.	5,500	.....	75f	2,000	5 to 7	8 threads to inch	No	Public	None	No
Grand Island, Nebr.	11,000	5	80	3,500	.....	Yes	Yes	Public	20	Some
Hastings, Nebr.	11,000	4	20	4,500	10	Yes	Yes	Telephone	None	Some
Lincoln, Nebr.	43,975	45	.....	7,500	8+	8 threads	No	Still	40	No
Nebraska City, Nebr.	8,000	2	60	3,000	8	.....	No	Public	Telephone	Partly
Norfolk, Nebr.	6,500	1	82	2,500	10	Yes	None	Public	.....	Yes
North Platte, Nebr.	5,000	None	132	4,000	2 to 3	Yes	No	Public	Telephone	No
Omaha, Nebr.	126,000	208	.....	30,000	4 to 6	No	Yes	Still	110	Yes
South Omaha, Nebr.	26,000	21	.....	5,000	8	No	.....	Public	12	Yes
Franklin, N. H.	7,250	.....	43	4,800	10 to 18	Yes	No	Public	16	No
Laconia, N. H.	12,000	10	68	10,000	5	Yes	No	Public	38	No
Manchester, N. H.	75,052	55	113	26,000	3	No	No	Public	91	No
Nashua, N. H.	29,000	23	63	11,000	6	No	Yes	Public	57	Yes
Portsmouth, N. H.	11,000	7	73	10,500	.....	No	No	Public	39	No
Atlantic City, N. J.	47,000	138	None	21,000	8	Yes	No	Both	88	Yes
Bayonne, N. J.	55,455	57	.....	10,000	.....	N. Y. Standard	Weekly drill	Public	73	No

d—Drivers. *f*—Volunteers. *g*—Partially paid.

FIRE DEPARTMENTS OF THE UNITED STATES—(Continued)

Name of City.	Population.	Number on Force.		Hose Length in Feet.	Average Serviceable Life of Hose.	Is Coupling National Standard?	Is There a Drill School?	Alarms Still or Public.	Number of Alarm Boxes.	Wires in Business District Underground?
		Paid Men.	Call Men.							
Bordentown, N. J.	4,200	None	200*f*	2,200	.....	No, Jones Phil. coupling	No	Public	None	No
Burlington, N. J.	9,500	.....	374*f*	6,350	10	No	No	Both	22	No
Camden, N. J.	94,538	111	None	15,800	6 to 10	Jones coupling	No	.....	151	Yes
East Orange, N. J.	35,000	43	.....	15,000	10	No	.....	Public	75	Partly
Elizabeth, N. J.	73,000	59	30	12,000	7	N. Y. Standard	Yes	Public	108	Some
Hackensack, N. J.	14,000	12	145*f*	6,500	4 to 6	Yes	No	Public	40	No
Hoboken, N. J.	70,500	91	None	11,000	7	N. Y. 8 thread to inch	Trying to get one	Still	Gamewell 61	No
Irvington, N. J.	12,877	9	20	3,500	5	Yes	.....	Public	40	No
Jersey City, N. J.	267,700	218	None	30,000	8	Yes	Yes	Both	275	Yes
Kearny, N. J.	18,666	.....	150*f*	7,800	9	Yes	No	Public	28	No
Long Branch, N. J.	15,000	16	450	6,000	5	Yes	No	Public	40	No
Millville, N. J.	12,500	2	41	4,000	8	Yes	.....	Both	16	No
Montclair, N. J.	25,000	16–3*g*	42	7,000	6	Yes	No	Both	84	No
Morristown, N. J.	15,000	4	200	6,800	3	No	No	Both	28	Yes
Newark, N. J.	350,000	376	None	50,880	5	Yes	Being inaugur.	Gamewell	Gamewell 480	Yes
Passaic, N. J.	60,000	34	.....	6,000	.....	No	Being considered	Still	58	No
Paterson, N. J.	130,000	135	None	17,000	4	No	Yes	Still	180	Few
Perth Amboy, N. J.	35,000	10	200	7,500	.....	Yes	No	Public	35	No
Phillipsburg, N. J.	15,700	.....	6 companies *f*	3,500	.....	Yes	.....	Public	22	No
Plainfield, N. J.	22,000	18	30	8,000	6	No	No	Gamewell with whistle	50	No
South Amboy, N. J.	7,500	.....	140*f*	2,600	5	.....	.....	Public	7	No
Summit, N. J.	7,500	3	(*f*)	4,200	6	Yes	No	Public	31	No
West Hoboken, N. J.	35,000	13	210	5,700	6	Yes	No	Public	27	No
Westfield, N. J.	7,500	2	48	2,000	.....	No	No	.....	12	No
Albuquerque, N. M.	11,250	9	.....	.....	4	No	No	Public	11	No
E. Las Vegas, N. M.	10,000	3	50	2,500	2½	Yes	.....	Public	1	No
Roswell, N. M.	10,000	7	3	.....	7	No	Fire gong drill, every two weeks	Still	Telephone	No
Amsterdam, N. Y.	33,000	26	.....	10,000	7	No	Yes	Public	66	No
Auburn, N. Y.	34,668	45	15	8,000	6	No	Yes	Public	68	Yes
Batavia, N. Y.	11,000	.....	.....	2,000	3	Yes	.....	Public	33	Yes
Binghamton, N. Y.	50,000	34	5	11,000	12	Yes	.....	Public	108	No
Corning, N. Y.	15,000	6	15	5,000	.....	Yes	No	Public	30	Partly
Cortland, N. Y.	12,000	3	150*f*	7,000	10	Yes	No	Public	40	No
Dansville, N. Y.	4,500	.....	125*f*	3,500	10	Yes	.....	Public	None, tel. system	.....
Elmira, N. Y.	37,000	41	1	7,000	10	No	Yes	Gamewell system	77	No
Fulton, N. Y.	10,500	9	14	3,000	.....	8 threads to inch	Drill service	Public	22	No–soon
Gloversville, N. Y.	20,000	15	15	6,000	.....	No	Yes	Public	43	No
Herkimer, N. Y.	8,000	.....	100*f*	3,300	10	Yes	.....	Public	13	No
Hoosick Falls, N. Y.	5,000	.....	120	2,500	10	Yes	No	Public	None	No
Hornell, N. Y.	14,000	8	15–120*f*	6,500	5	No	No	Both	30	Yes
Hudson, N. Y.	11,000	.....		6,000	5 to 7	Yes	Once a week	Public	23	No
Ithaca, N. Y.	18,000	6–10*g*	450*f*	10,000	12	Yes	No	Both	40	Before council now
Jamestown, N. Y.	32,987	35	20	8,000	8	No	Individual company drills	Public	82	No
Johnstown, N. Y.	10,000	3	85*f*	6,000	5	2½ in. coupling 7 threads to inch	.....	Gamewell system	32	No
Little Falls, N. Y.	13,000	5	12	6,000	10	Yes	Yes	Both	29	Telephone Co. only
Malone, N. Y.	6,000	4	40	4,500	10	Yes	.....	Public	24	No
Mamaroneck, N. Y.	6,000	None	None	4,000	.....	Yes	Once a month	Public	20	No
Middletown, N. Y.	17,500	10	(*f*)	7,200	10	No	No	Public	52	No
Newburgh, N. Y.	30,000	15	600	10,000	5	Yes	No	Public	38	No–soon
New Rochelle, N. Y.	28,535	20	345*f*	6,800	3 to 4	No	No	Public	60	.....
North Tonawanda, N. Y.	12,000	1*d*	300*f*	14,000	5 to 10	Yes	No	Public	50	No
Ogdensburg, N. Y.	16,000	9	17	5,000	10	No	.....	Public	35	No
Oneida, N. Y.	9,000	5	35–25*f*	3,000	5 to 7	Yes	Yes	Public	18	No
Oneonta, N. Y.	10,000	6	35	5,000	8	No	No	Public	27	No
Oswego, N. Y.	25,000	17	17	8,000	6 to 7	No	No	Both	50	No
Owego, N. Y.	4,500	.....	262*f*	6,000	15 to 20	7½ thread	No	Public	Gamewell	....
Peekskill, N. Y.	16,293	6	400	4,000	.....	Yes	No	Public	26	No
Port Chester, N. Y.	15,000	.....	.....	8,000	.....	Yes	.....	Public	47	No
Rensselaer, N. Y.	11,775	6	250*f*	5,000	5	Yes	.....	Public	18	No
Rochester, N. Y.	225,000	296	50*f*	63,700	6 to 10	No	Yes	Still	337	Yes
Rome, N. Y.	22,000	14	6	9,800	6	No	.....	Public	45	No
Saratoga Springs, N. Y.	12,650	11	15	7,250	15	No	No	Public	42	No
Schenectady, N. Y.	74,000	84	320*f*	22,000	5	No	Yes	Both	90	Yes
Syracuse, N. Y.	138.000	166	.....	23,000	6	No	Yes	Public	184	Yes
Troy, N. Y.	80,000	67	4-450 *f*	26,000	Don't know	No, Bliss	No	Public	127	No–soon
Utica, N. Y.	74,419	109	.....	17,550	.....	No	Yes	Still	127	Partly
Waverly, N. Y.	5,000	.....	125*f*	3,000	.....	Yes	No	Public	15	No
Westfield, N. Y.	4,500	None	90*f*	2,500	15	.....	No	Public	None	No
Yonkers, N. Y.	85,000	99	.....	15,000	7	No	.....	Still	155	No
Charlotte, N. C.	50,000	18	.....	4,500	8	Yes	.....	Public	48	No
Durham, N. C.	26,000	13	16–15*f*	6,000	4 to 5	Yes	.....	Public	33	No
Elizabeth City, N. C.	9,000	3	40	2,500	3	Yes	No	Public	14	No
Greensboro, N. C.	27,800	(*d*) 1*j*	.....	5,000	.....	Yes	.....	Public	32	No
Henderson, N. C.	5,000	2	40	3,600	4 to 6	Yes	Yes	.....	Telephone	No
Kinston, N. C.	8,000	2	40	2,500	5	Yes	.....	Public	None	.....
Raleigh, N. C.	22,000	9	12	7,000	8	No	No	Public	35	No
Reidsville, N. C.	5,000	.....	8	1,300	5 to 7	Yes	.....	Telephone	.....	.....
Salisbury, N. C.	7,153	2	20*g*	3,200	10 to 12	Yes	No	.....	None	No
Washington, N. C.	8,000	7	80	6,000	4	Yes	Yes	Public	None	.....
Winston-Salem, N. C.	22,700	8	100	4,000	6	7½ thread	.....	Public	27	Yes

d—Drivers. *f*—Volunteers. *g*—Partially paid. *j*—Engineer.

FIRE DEPARTMENTS OF THE UNITED STATES—(Continued)

Name of City.	Population.	Number on Force.		Hose Length in Feet.	Average Serviceable Life of Hose.	Is Coupling National Standard?	Is There a Drill School?	Alarms Still or Public.	Number of Alarm Boxes.	Wires in Business District Underground?
		Paid Men.	Call Men.							
Dickinson, N. D.	4,000	.....	30	1,500	5	No	.....	Public	.....	.....
Grand Forks, N. D.	15,000	9	8	5,500	10	Yes	Yes	Both	30	Yes
Valley City, N. D.	.....	.....	60*f*	2,650	.....	No	.....	Public	.....	.....
Akron, Ohio	70,000	78	.....	14,500	5	No	Yes	Both	115	Yes
Alliance, Ohio	15,085	15	10	4,500	12	No	Yes	Public	71	No
Ashtabula, Ohio	20,000	.....	126	3,000	.....	Yes	Drill once a month	Public	None	No
Barberton, Ohio	10,000	6	14	4,000	8 to 10	Yes	No	Both	40	No
Bellaire, Ohio	14,000	1*d*	45	5,000	10 to 12	.....	No	Public	25	No
Bellefontaine, Ohio	8,300	7	8	3,400	5	Yes	Yes	Public	13	No
Bucyrus, Ohio	8,300	5	16	3,700	11	No	Yes	Public	16	Some
Chillicothe Ohio	16,000	11	.....	4,000	10	No	Yes	Public	40	No
Cincinnati, Ohio	364,463	560	.....	90,000	.....	.....	No	Still	659	.....
Circleville, Ohio	7,000	5	.....	3,000	15	Yes	.....	Public	24	No
Cleveland, Ohio	600,000	534	.....	55,000	6	Yes	No	Both	475	Yes
Columbus, Ohio	181,000	262	.....	33,600	7 to 8	No	Yes	Both	242	No
Conneaut, Ohio	11,000	4	60	4,000	5	Yes	.....	Public	.....	.....
Defiance, Ohio	8,000	3–10*g*	40	3,500	12 to 15	Yes	.....	Both	20	No
Dennison, Ohio	4,100	60	60	4,000	8	Yes	.....	Public	12	No
East Cleveland, Ohio	10,000	5	.....	2,000	4	Yes	No	Telephone	.....	.....
East Liverpool, Ohio	23,500	14	.....	7,500	.....	No	.....	Both	25	No
Eaton, Ohio	4,500	2	20	2,000	10	Yes	No	Both	.....	No
Elyria, Ohio	14,825	21	5	5,250	5	No. 8 threads	No	Both	15	No
Findlay, Ohio	16,000	14	.....	8,000	8	No	No	Still	37	No
Galion, Ohio	8,500	5	10	3,500	8	Yes	.....	Public	24	No
Gallipolis, Ohio	5,680	1	20	3,000	8	No	No	Public	Telephone	No
Greenfield, Ohio	4,500	2	10	1,800	5	No	No	Public	Telephone	No
Greenville, Ohio	7,000	4	8	2,500	10	Yes	No	Public	21	No
Hillsboro, Ohio	5,000	3	10	2,000	2	Yes	.....	Public	24	.....
Jackson, Ohio	5,624	8	.....	2,000	8	Yes	Yes	.....	Telephone	No
Kenton, Ohio	9,000	2	13*b*	3,000	6	Yes	Drill once a month	Public	22	Partly
Lancaster, Ohio	14,000	7	.....	3,000	.....	No	.....	Public	31	No
Lorain, Ohio	35,000	25	105	14,000	5 to 6	Yes	Yes	Both	.....	No
Mansfield, Ohio	20,768	21	6	6,500	12	Yes	No	Public	63	No
Marion, Ohio	18,000	11	16	5,700	12	No	No	Public	43	No
Massillon, Ohio	13,000	12	27	4,300	6	7 threads to inch	Monthly	Public	43	No
Miamisburg, Ohio	5,000	3	16	3,000	7	Yes	Yes	Public	None	No
Mt. Vernon, Ohio	10,000	6	.....	3,000	15 to 18	No	.....	Public	18	No
Nelsonville, Ohio	6,082	2	6	2,000	6	Yes	No	Both	None	No
Newark, Ohio	25,404	22	.....	6,500	12	Yes	No	Public	29	No
New Philadelphia, Ohio	10,000	4	20	3,000	8	Yes	No	Public	21	No
Norwalk, Ohio	8,500	3	17	3,500	10	Yes	Yes	Public	.....	No
Norwood, Ohio	16,183	13	.....	2,500	5	No	Yes	Still	31	No
Oberlin, Ohio	5,000	1	24	3,500	15	No	.....	Public	Telephone	Yes
Painesville, Ohio	6,000	6	15	3,000	10	Yes	No	Public	None	No
Piqua, Ohio	16,000	18	.....	6,000	5	No	1	Both	39	No
Portsmouth, Ohio	26,000	26	9	5,200	8 to 10	Yes	.....	Public	74	No
St. Bernard, Ohio	5,200	3	25	3,200	2 to 10	Yes	.....	Public	19	No
St. Mary's, Ohio	5,732	3	.....	1,900	10	Yes	.....	Still	None	No
Salem, Ohio	9,000	2	75*f*	3,500	5 to 10	No. "Quick as wink"	Yes	Public	Tel.	No
Shelby, Ohio	4,933	2	10	1,800	6 to 8	No	No	Public	Telephone	No
Steubenville, Ohio	22,391	15	60	5,000	10	No. 6 threads	.....	Public	26	No
Tiffin, Ohio	12,000	13	12	4,550	15	No. 8 threads	No	Public	32	No
Toledo, Ohio	180,000	217	.....	32,000	5	No	No. Each Co. drills	Public	300	Yes
Toronto, Ohio	4,500	1	21	1,500	.....	Yes	Yes	Public	None	.....
Uhricsville, Ohio	5,000	2	6	1,000	5	Yes	Yes	Public	None	No
Urbana, Ohio	8,000	5	5	3,800	5	Yes	.....	Still	.....	No
Van Wirt, Ohio	7,550	4	20	4,000	6	Yes	2 drills each month	Public	13	No
Warren, Ohio	12,000	10	.....	4,500	12	Yes	Yes	Public	42	No
Washington C. H., Ohio	8,000	2	10	2,500	8	Yes	.....	Still	.....	.....
Wellston, Ohio	8,000	1	4	2,150	7	Yes	No	Still	Telephone	.....
Youngstown, Ohio	83,000	77	.....	16,000	8	No	Yes	Public	108	Yes
Zanesville, Ohio	28,500	29	.....	8,900	10	No	No	Public	80	No
Blackwell, Okla.	4,000	2	15	2,500	4	Yes	.....	Public	None	.....
Chickasha, Okla.	10,320	10	.....	5,000	4	Yes	.....	Public	Telephone	No
Durant, Okla.	8,000	4	4	1,900	6 to 8	No. Anderson	.....	Public	Telephone	.....
Enid, Okla.	15,000	12	2	4,400	4½	No	.....	Both	21	No
Guthrie, Okla.	22,000	18	.....	13,000	6	Mostly	Drill every week	Public	6	No
Hugo, Okla.	6,000	3	25	2,000	2	Yes	Drill twice a month	Both	None	.....
McAlester, Okla.	15,000	12	.....	4,500	.....	No	.....	Public	15	No
Muskogee, Okla.	30,000	37	.....	8,000	7	No	No	Still	48	No
Okmulgee, Okla.	6,500	6	5	3,000	1½	Yes	Weekly	Both	None	No
Shawnee, Okla.	15,000	12	.....	6,000	5	No	.....	Public	Telephone	No
Tulsa, Okla.	20,000	18	.....	6,000	5	No	Yes	Public	35	No
Astoria, Ore.	10,000	11	17	8,500	10	Pacific coast thread	Regular drill	.....	19	No
Baker, Ore.	8,000	4–2*g*	20	5,500	8 to 10	7½ threads to inch	No	Public	None	No
Eugene, Ore.	10,500	2	130	3,800	8	No. Pacific Coast	No	Public	Telephone	No
Portland, Ore.	210,000	270	.....	45,000	6	Yes	No	Both	204	Yes
Salem, Ore.	14,000	9	13	3,000	5	Yes	.....	Public	None	No
Allentown, Pa.	53,000	34	1,000	14,600	4	Yes	No	Both	98	No
Altoona, Pa.	54,127	56	65	17,400	8	No	No	Public	88	No
Bangor, Pa.	6,000	.....	110	6,000	5	No	.....	Public	11	No
Beaver Falls, Pa.	12,000	6	45	5,000	8	Yes	No	Public	27	No
Chambersburg, Pa.	12,000	7	.....	5,000	10	Yes	.....	Public	22	No
Coatesville, Pa.	12,000	.....	500*f*	2,500	10	Yes	No	Both	14	No
Conshohocken, Pa.	7,500	2	.....	3,000	.....	Yes	.....	Public	.....	No
Du Bois, Pa.	13,000	None	300	5,000	.....	Yes	.....	Public	None	.....
Easton, Pa.	28,523	20	32	10,000	8	No	No	Public	57	No
Erie, Pa.	66,525	78	21	22,000	7	No	No, drill once a week	Public	150	Yes
Forest City, Pa.	6,000	None	100	2,000	10	Yes	.....	Public	.....	No

b—Paid. *d*—Drivers. *f*—Volunteers. *g*—Partially paid.

FIRE DEPARTMENTS OF THE UNITED STATES—(Continued)

Name of City.	Population.	Number on Force.		Hose Length in Feet.	Average Serviceable Life of Hose.	Is Coupling National Standard?	Is There a Drill School?	Alarms Still or Public.	Number of Alarm Boxes.	Wires in Business District Underground?
		Paid Men.	Call Men.							
Franklin, Pa	9,767	2	12	4,000	8 to 10	No	.....	Both	11	No
Harrisburg, Pa	70,000	23*d*	(*f*)	18,000	.....	Harrisburg standard	.....	Public	64	No
Hazleton, Pa	25,000	6*d*	(*f*)	7,000	15 to 20	No	No	Public	40	No
Jeannette, Pa	9,000	.....	79	3,500	.....	Yes	.....	Public	Telephone	No
Johnstown, Pa	55,482	68	None	17,000	5 to 7	No	Yes	Still	95	No
Latrobe, Pa	8,777	.....	125*f*	3,500	4	.....	Yes	Public	.....	.....
Lebanon, Pa	20,000	7	(*f*)	7,500	7	Yes	.....	Public	30	No
Lewistown, Pa	8,500	.....	275	3,600	8	Yes	No	Public	.....	Partially
Meadville, Pa	15,000	6	53	9,450	15	No. 8 thread	No	Public	38	No
Mt. Carmel, Pa	17,000	.....	300	4,100	6	.....	.....	Public	.....	No
Nanticoke, Pa	19,000	2	155	5,000	12	Yes	.....	Both	17	No
New Brighton, Pa	8,500	.....	50	4,500	9	No. 8 thread	No	Public	Telephone	No
New Castle, Pa	38,200	28	175	10,500	8	No	No	Public	72	Partly
Oil City, Pa	20,000	4–17*g*	.....	3,200	10	No	No	Public	29	No
Olyphant, Pa	8,000	1	.....	2,000	10	Yes	No	Gamewell Public	14	No
Pittsburg, Pa	535,000	791	.....	.....	10	.....	No	Both	800	Yes
Philadelphia, Pa	1,549,008	975	.....	110,000	4 to 10	No	.....	.....	1,862	Yes
Pottsville, Pa	22,000	1	(*f*)	7,600	.....	Yes	.....	Public	34	No
Punxsutawney, Pa	10,000	.....	36	3,100	6	Yes	.....	Public	Telephone	No
Scranton, Pa	129,867	106	36	17,800	8	Yes	No	Still	184	Yes
Shenandoah, Pa	26,000	.....	(*f*)	2,000	5	Yes	No	Public	27	No
South Sharon, Pa	10,000	3	51	5,000	9	"Quick as a Wink" coupling	.....	.....	None	No
Steelton, Pa	15,000	.....	(*f*)	4,000	3	Jones	No	Public	20	No
Stroudsburg, Pa	5,000	None	80	3,000	.....	Yes	No	Public	None	No
Tamaqua, Pa	9,500	None	300	5,000	14	½–½ Jones	No	Public	None	No
Tyrone, Pa	7,000	200	(*f*)	4,750	3	Yes	No	Public	Telephone	No
Uniontown, Pa	20,000	5*d*	50	3,000	8 to 10	Yes	No	Public	32	No
Warren, Pa	13,500	7	15*g* 140*f*	4,000	.....	Yes	No	Public	21	No
Washington, Pa	18,000	6	40	5,500	8	Yes	.....	Both	49	No
Westchester, Pa	11,000	1	(*f*)	4,800	10	No	.....	Public	27	No
Williamsport, Pa	45,000	27	33	10,000	15 to 18	No	Yes	Public	Telephone	No
Wilkes-Barre, Pa	70,000	42	75	16,000	12 to 15	No	No	Public	104	No
York, Pa	50,000	16	4	16,000	5	Yes	No	Public	60	No
Pawtucket, R. I	53,000	51	4	16,000	10	Yes	.....	Public	132	No
Westerly, R. I	10,000	3	.....	4,000	6	Yes	.....	Public	26	No
Charleston, S. C	58,833	70	33	22,700	4	.....	Yes	Public	120	Partly
Greenwood, S. C	10,000	5	40	2,000	3	No	No	.....	14	No
Newberry, S. C	6,000	2*d*	20	2,500	.....	No	.....	Public	.....	.....
Orangeburg, S. C	8,000	4	(*f*)	2,200	5	No	None	Public	17	No
Union, S. C	.....	16	10	2,000	5	Yes	None	Still	8	No
Aberdeen, S. D	12,000	14	4	4,200	.....	No	Yes	Telephone	.....	No
Mitchell, S. D	8,000	2	35	3,000	15	Yes	No	Public	None	No
Sioux Falls, S. D	20,000	11	.....	.....	5	No	1	Public	20	No
Watertown, S. D	8,000	3	13	2,000	.....	Yes	No	Public	Telephone	Yes
Chattanooga, Tenn	44,600	76	.....	15,750	4	No	None	Both	76	No
Cleveland, Tenn	6,500	2	14*g*	1,700	5	Yes	No	Public	30	No
Dyersburg, Tenn	4,149	.....	9*f*	2,000	3 to 5	Yes	No	Public	None	No
Jackson, Tenn	16,700	9	.....	4,000	5	Yes	.....	Public	.....	No
Knoxville, Tenn	36,362	72	8*g*	11,000	8 to 10	No. Fehy.	No	Still	73	No
Memphis, Tenn	132,000	158	20	24,000	4	No	.....	Both	83	Yes
Murfreesboro, Tenn	6,000	7	3	2,000	5	Yes	.....	Public	Telephone	No
Nashville, Tenn	110,364	114	.....	19,500	5 to 8	Yes	No	Public	158	Yes
Austin, Tex	30,000	10	500*f*	15,000	.....	No	No	Public	None	Yes
Beaumont, Tex	28,000	31	.....	10,000	6	No	No	Public	52	No
Brownsville, Tex	10,500	.....	(*f*)	2,500	8	Yes	.....	Public	None	No
Brownwood, Tex	10,000	2*d*	30	3,000	5	Anderson	No	Public	None	No
Corpus Christi, Tex	10,000	9	150*f*	3,000	6 to 10	No	No	Public	None	No
Dallas, Tex	100,000	128	7	29,000	4 to 5	Yes	No	Public	238	No
Denton, Tex	6,000	2*d*	3–30*f*	1,800	6	Yes	.....	Public	Telephone	No
El Paso, Tex	39,300	40	.....	10,500	4 to 5	No	Regular drill	Public	75	No
Ennis, Tex	6,500	(*d*)	25	2,000	4	Yes	Drill practice	Public	.....	No
Fort Worth, Tex	75,000	100	5	22,000	4	No	None	Still	90	Yes
Gainesville, Tex	1,200	5	95	4,000	5 to 10	No. Anders'n	.....	Public	Telephone	.....
Galveston, Tex	40,000	63	.....	11,350	.....	No	None	Both	65	Yes
Greenville, Tex	14,000	6	28	5,000	6	Yes	.....	Telephone	.....	No
Paris, Tex	15,000	18	15	3,000	4	Yes	.....	Public	Telephone	Partly
San Angelo, Tex	10,000	2	18	2,300	.....	Yes	Drill once a month	Public	None	No
San Antonio, Tex	100,000	105	.....	23,750	6 to 7	No	.....	Public	117	Yes
Sherman, Tex	15,000	15	.....	7,150	4 to 6	Yes	.....	Telephone	None	No–soon
Tyler, Tex	10,400	7	25	3,300	6	Yes	.....	Public	.....	.....
Waco, Tex	35,000	34	28–205*f*	12,000	4 to 5	Yes	None	Public	87	No
Waxahachie, Tex	8,000	4	27	2,300	5	Yes	None	Both	Telephone	No
Ogden, Utah	28,000	19	23	7,200	6	No	Yes	Public	26	No
Provo City, Utah	9,000	3	22	2,250	10	Anderson	.....	Public	.....	No
Salt Lake City, Utah	92,777	77	3	20,000	3 to 11	No. 6 thread to inch	Yes	Public	.....	Yes
Alexandria, Va	16,000	7	100*f*	4,000	.....	No. Jones	.....	Telephone	.....	No
Charlottesville, Va	10,000	3	50	5,000	6	No	No	Both	.....	No
Clifton Forge, Va	6,400	32	32	1,750	6	Yes	.....	Public	.....	No
Harrisonburg, Va	5,000	.....	150	1,500	15	Yes	.....	Public	10	No
Lynchburg, Va	30,000	47	.....	10,000	10	Yes	Yes	Public	73	Yes
Norfolk, Va	81,000	94	.....	25,550	5	No. 7 to inch	Yes	Both	127	Yes
Petersburg, Va	25,000	23	.....	5,600	5	.....	.....	Still	40	No
Portsmouth, Va	35,000	21	400*f*	7,500	5	No	.....	Public	37	No
Richmond, Va	140,000	128	48	30,750	6	No	Yes	Both	261	Yes
Roanoke, Va	37,500	55	4	10,000	8	No	Yes	Both	78	Yes
Staunton, Va	11,400	11	25	1,650	8	No	No	Public	30	No
Winchester, Va	7,000	3	.....	3,000	6	Yes	.....	Public	.....	.....
Bellows Falls, Vt	5,000	1	37	5,200	12	Yes	No	Both	17	No
St. Albans, Vt	6,000	4	23	4,200	6	Yes	Twice a month	Both	28	Soon
St. Johnsbury, Vt	8,000	.....	73*f*	5,500	5	Yes	No	Both	30	No
Aberdeen, Wash	15,000	17	.....	6,500	.....	Yes	.....	Public	28	Partly

d—Drivers. *f*—Volunteers. *g*—Partially paid. *m*—Varies slightly, but will fit standard.

FIRE DEPARTMENTS OF THE UNITED STATES—(Continued)

Name of City.	Population.	Number on Force. Paid Men.	Number on Force. Call Men.	Hose Length in Feet.	Average Serviceable Life of Hose.	Is Coupling National Standard?	Is There a Drill School?	Alarms Still or Public.	Number of Alarm Boxes.	Wires in Business District Underground?
Bellingham, Wash.	24,482	13	.....	7,500	10	Yes	No	Public	49	No
Everett, Wash.	24,814	22	.....	7,000	5	Yes	No	Public	40	No
Hoquiam, Wash.	10,000	10	50*f*	6,250	.....	No	.....	Public	27	No
North Yakima, Wash.	16,000	16	10	6,000	.....	Yes	.....	Public	23	No
Olympia, Wash.	7,000	5	.....	3,900	10	No	No	Public	16	No
Spokane, Wash.	105,000	125	.....	25,000	5	Yes	.....	Still	264	Now being placed
Tacoma, Wash.	125,000	117	.....	44,000	4	Yes	No	Public	294	No
Vancouver, Wash.	10,000	5	35	5,000	4	Yes	Yes	Public	Telephone	No
Walla Walla, Wash.	20,000	17	.....	5,600	8	Yes	No	Public	54	Partly
Charleston, W. Va.	30,000	26	5	5,000	3	No. Fehy.	Yes	Public	28	No
Elkins, W. Va.	6,000	.....	60	3,000	3	No	Yes	Public	None	No
Morgantown, W. Va.	15,000	.....	26	5,200	.....	Yes	.....	Public	.....	No
Wellsburg, W. Va.	4,700	.....	36	2,000	6	Yes	Drill once a month	Both	None	.....
Wheeling, W. Va.	49,000	50	.....	17,000	7	Yes	Yes	Both	99	No
Appleton, Wis.	17,000	20	.....	6,000	7	Yes	.....	Public	70	No
Ashland, Wis.	12,000	15	8	5,000	.....	Yes	.....	Public	32	No
Baraboo, Wis.	6,300	.....	28	3,200	.....	No	.....	Public	4	No
Beaver Dam, Wis.	7,000	.....	30	2,700	.....	Yes	No	Public	None	No
Chippewa Falls, Wis.	9,000	7	5	4,000	8	No	.....	Public	23	No
Eau Claire, Wis.	18,310	20	(*n*)	10,000	10	No	No	Public	39	Yes
Grand Rapids, Wis.	6,700	4	26	3,200	7	Yes	No	Public	Telephone	No
Janesville, Wis.	13,800	13	10	6,000	8	No	No	Both	66	No
Kenosha, Wis.	22,000	14	.....	7,000	5 to 7	No	.....	Public	58	No
La Crosse, Wis.	30,417	51	.....	14,600	.....	Yes	Yes	Public	53	Yes
Madison, Wis.	28,000	28	.....	8,000	6	No	.....	Both	54	Some
Manitowoc, Wis.	14,000	13	3	4,800	10	Yes	No	.....	53	No
Marshfield, Wis.	6,500	2	26	3,500	15	No	.....	Telephone	.....	Partly
Menomonie, Wis.	5,500	2	35	2,000	4	Yes	.....	Public	None	No
Merrill, Wis.	9,000	10	.....	5,000	8 to 10	.....	.....	Public	6	No
Milwaukee, Wis.	.....	506	.....	89,500	6	Yes	No	Public	690	Yes
Neenah, Wis.	6,000	.....	15*f*	3,300	.....	No	.....	Public	None	Yes
Plymouth, Wis.	3,300	.....	150*f*	2,500	.....	No	No	Both	None	No
Portage, Wis.	6,000	4	25	2,000	.....	Yes	.....	Public	.....	No
Racine, Wis.	41,600	40	.....	12,500	6 to 10	No.6 threads	No	Public	46	Yes
Rhinelander, Wis.	6,000	4	8	4,200	8	Yes	Yes	Public	17	No
Ripon, Wis.	4,000	.....	25	3,000	6	Yes	No. Drill once a month	Public	None	.....
Sturgeon Bay, Wis.	5,000	3	24	4,000	8	Yes	.....	Still	3	No
Superior, Wis.	41,000	53	1	13,000	10	No	No	Both	75	Partly
Waukesha, Wis.	8,000	2	24	3,250	5	Yes	No	Public	None	No
Wausau, Wis.	16,560	21	1	8,500	8	Yes	No	Public	Telephone 32	No
Sheridan, Wyo.	10,000	4	27	3,000	8	No.Anderson	No	Public	Telephone	.....

f—Volunteers. *n*—Four men with two horse hose reels, and maintained by a lumber company cover a city district, city pays a flat rate per year for the service.

NUMBER OF MEN ON FORCE

These figures are, perhaps, the least satisfactory of any in the table, because of the different conditions under which the members are enrolled. In some cities all members are fully paid, and in these comparison is easy and useful. But in most of the smaller cities and towns only from one to fifteen men are fully paid, the remainder being volunteers. The numbers of volunteers reported is the chief obstacle to intelligent comparison of the strengths of departments. In some towns one person out of every thirty or forty inhabitants is enrolled as a volunteer; in others of the same size, one in two or three thousand. The figures given in the summary are for paid men only, and for all combined, paid, partly paid and volunteers.

In cities having more than 1,000,000 population there is one paid fireman to each 1,346 population, and one of all kinds to each 1,326.

In cities of 50,000 to 1,000,000 there is one paid man to each 897 population and one of all kinds to each 747.

In cities of 25,000 to 50,000 there is one paid man to each 798 population, and one of all kinds to each 403.

In cities of 10,000 to 25,000 there is one paid man to each 1,478 population, and one of all kinds to each 282.

In cities of less than 10,000 there is one paid man to each 1,539 population, and one of all kinds to each 168.

This shows the fully paid men to increase in proportion to the population as this becomes less, probably because of the larger territory per capita to be covered. But as the cities become smaller than 25,000 the number of paid firemen per capita decreases, because of the substitution of volunteers in large numbers.

FIRE HOSE

The amount of hose required does not depend solely upon population, but in general it varies with the size of the city. Not only this, but the per capita amount of hose is found to vary with the population, the largest cities having much less hose per capita than the smallest. The feet per capita of hose in the listed cities are as follows: More than 1,000,000, 0.11 feet; 50,000 to 1,000,000, 0.22 feet; 25,000 to 50,000, 0.28 feet; 10,000 to 25,000, 0.37 feet; 10,000 and less, 0.47 feet.

Concerning the serviceable life of hose, there is great difference of opinion, 1½ years and 20 years being the extremes. This may be due to differences in the hose purchased, in the care taken of it and the frequency of its use. Probably a considerable number of the figures were guesses only, no record being kept which would furnish the information. Also the individual definitions of the word "serviceable" may have varied. One hundred and four made no report. Of 588 replying 115 named 5 years; 90 named 6 years; 89 named 10 years; 70 named 8 years; 55 named 7 years; 62 named 4 years; 24 named 9 years and the same number 3 years; 20 named 12 years; 18 named 15 years; 10 named 2 years; 6 named 14 years and the same number 11 years; 3 named 13 and 17 years; and 1½, 16 and 20 were each named by one. The average of all replies was 7.8 years.

Concerning the use of the National Standard coupling on hose there appeared to be a regrettable amount of ignorance as to just what this is; one chief stating that his department used it, with 8 threads to the inch. On the other hand, an unexpected and gratifying number reported using this standard. While some may have erroneously reported doing so, in ignorance of just what this standard is, we have endeavored to eliminate such as far as possible. Apparently 400 cities and towns have adopted the National Standard, and 11 have adopted it in part or their reply was doubtful.

DRILL SCHOOLS.

Several apparently mistook the term "drill school" to mean fire drills in public schools, replying that all or most of the schools in town had them. It is also a question just where the line should be drawn between regular drill schools and periodic company drills. The returns appear to show that

(*Continued on page 376.*)

FIRE DEPARTMENT STATISTICS

Apparatus in Service, Number of Pieces.

City.	Pumping Engines.		Hose Wagons, Plain		Hose Wagons, Comb.		Chemical Engines.		Ladder Trucks.		Supply Wagons	Other Apparatus.
	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	
Anniston, Ala.	...	...	2	...	...	...	...	...	...	...	...	1 auto
Bessemer, Ala.	...	...	1	...	1	...	...	...	1a	...	...	1 horse reel. 2 hand reels
Birmingham, Ala.	6	2	4	...	2	12	1	...	2	...	1	
Eufaula, Ala.	1	...	1	...	...	...	...	...	1	...	...	
Montgomery, Ala.	5	2	4	...	3	..	1	...	2	...	...	
Selma, Ala.	1	...	1	...	1	...	1	...	1	...	1	Chief's auto
Sheffield, Ala.	2	...	1	...	...	...	...	...	1	...	...	1 hose reel
Talladega, Ala.	...	...	2	...	...	...	...	...	1	...	...	2 hand reels
Bisbee, Ariz.	...	...	2	...	...	...	1a	...	...	...	...	4 hand reels
Douglas, Ariz.	1	...	1	...	1	...	...	...	...	...	...	
Prescott, Ariz.	...	...	1	...	1	...	...	...	...	...	...	2 hose reels, 1 hand hose cart, 1 hook and ladder truck
Eureka Springs, Ark.	...	...	...	...	1	...	...	...	...	...	...	3 hand hose carts
Fayetteville, Ark.	...	...	1	...	...	...	...	...	...	...	...	1 hose cart
Fort Smith, Ark.	2	...	2	...	3	...	...	...	...	...	...	Chief's auto with chemical
Helena, Ark.	...	...	1	...	...	...	...	...	...	...	...	1–2 horse reel, 1 combination truck and chemical
Hot Springs, Ark.	...	...	3	...	1	...	...	...	1	...	...	1 hose wagon
Jonesboro, Ark.	...	...	1	...	...	...	...	...	1	...	...	
Little Rock, Ark.	3	...	4	...	1	...	...	1b	1	...	...	Aerial truck and 2 hose carts
Paragould, Ark.	...	...	...	...	1	...	...	...	...	...	...	
Pine Bluff, Ark.	...	...	2	...	1	...	...	...	...	...	...	
Texarkana, Ark.	1	1	1	...	...	2	...	...	1	...	...	1 chief's auto, 1 hose wagon in reserve
Alameda, Cal.	1	1	3	...	2	...	1	...	1	...	...	
Berkeley, Cal.	2	...	3	...	2	3	1	...	1	...	1	
Eureka, Cal.	3	...	11	...	...	...	...	...	2	...	...	
Fresno, Cal.	5	...	3	...	2	...	3	...	1	...	11	1 steam engine, 1 truck, 1 hose wagon in reserve
Grass Valley, Cal.	...	...	2	...	...	...	...	...	...	...	...	3 hose carts
Hanford, Cal.	...	...	2	...	1	1	..	...	1	...	...	
Long Beach, Cal.	1	1	...	...	1	2	...	1	1	...	1	
Los Angeles, Cal.	27	...	1	...	29	2	...	...	4	...	1	2 pumping engines, 1 combination hose wagon and 2 chemical engines in reserve
Marysville, Cal.	2	...	...	...	1	...	...	...	1	...	...	
Oakland, Cal.	14	...	7	...	6	3	1	...	5	...	1	1 steamer, 1 chemical, 1 hose wagon, 1 hose cart, 3 buggies and 2 autos
Pasadena, Cal.	3	...	3	...	...	...	4	1	1	...	...	1 hose cart in reserve
Pomona, Cal.	2	...	...	...	...	...	1	1	1	...	...	2 hand hose carts
Redlands, Cal.	...	...	...	...	1	1	...	...	...	...	...	
River Side, Cal.	1	...	2	...	...	1	...	...	1	...	...	1 hose reel not in commission
San Francisco, Cal.	41	...	43	...	3	...	12	...	12	...	3	2 chief's autos, 2 water towers, 3 monitor batteries, 2 fireboats
San Luis Obispo, Cal.	1	...	...	...	1	...	...	...	1	...	...	2 hand carts
Santa Barbara, Cal.	...	...	1	...	...	1	...	...	1	...	...	1 2-wheel hose cart
Santa Cruz, Cal.	...	...	1	...	1	...	...	...	1	...	...	3 hand hose carts
Santa Monica, Cal.	...	...	2	...	1	...	...	...	1	...	...	
Santa Rosa, Cal.	2	...	2	...	...	...	1	...	1	...	...	
Boulder, Col.	...	...	...	...	3	...	...	...	...	...	...	Motor for chief
Colorado Springs, Col.	1	...	...	...	2	1	...	...	2	...	...	1 auto for chief
Denver, Col.	9	...	16	...	...	...	1	...	5	...	1	1 water tower
Grand Junction, Col.	...	...	1	...	...	1	...	...	...	...	...	2 hose reels
La Junta, Col.	2	...	1	...	1	...	...	...	2	...	1	
Pueblo, Col.	2	...	5	...	3	1	...	...	2	...	...	1 chief's auto and 1 buggy
Trinidad, Col.	...	...	1	...	1	...	...	...	1	...	...	3 1-horse hose reels
Ansonia, Conn.	...	...	...	...	1	...	...	...	3	...	...	8 hose reels, 2 hand hose wagons
Bridgeport, Conn.	10	...	6	...	4	...	2	...	3	...	5	Chief's auto; expect to buy 2 auto pumping engines and 2 auto combination hose wagons
Danbury, Conn.	1	...	2	...	...	...	...	1	1	...	1	
Danielson, Conn.	1	...	3	...	...	...	...	...	1	...	1	
Hartford, Conn.	8	2	...	...	11	2	...	...	4	...	9	1 auto pumping engine and 1 horse engine in reserve
Middletown, Conn.	...	...	1	...	1	1	...	...	1	...	...	
New Britain, Conn.	3	...	...	...	5	...	...	...	2	...	1	
New Haven, Conn.	12	...	6	...	6	1	...	1	4	...	6	2 autos for chief, 3 steam engines, 2 wagons, 1 truck in reserve
Norwalk, Conn.	...	...	1	...	...	1	...	...	1	...	1	
Norwich, Conn.	2	...	3	...	3	...	...	...	2	...	2	
Putnam, Conn.	...	...	3	...	...	...	...	...	1	...	...	
Southington, Conn.	...	...	4	...	...	...	...	...	2	...	1	
South Manchester, Conn.	10	3	2	...	2	1	2	...	2	...	...	
South Norwalk, Conn.	...	...	...	...	1	...	2	...	1	...	2	
Stamford, Conn.	3	...	2	...	1	1	...	...	2	...	2	
Wallingford, Conn.	...	...	2	...	...	...	...	...	2	...	...	
Waterbury, Conn.	3	1	3	1	2	...	...	1	2	...	2	1 chief's auto
West Haven, Conn.	...	1c	1	...	...	...	...	...	1	...	...	3 hose reels, 1 hand engine, 2 auto hose wagons ordered
Willimantic, Conn.	...	...	...	...	3	...	...	...	2	...	2	
Washington, D. C.	26	1	13	...	17	...	7	...	11	...	4	1 wreck wagon, 5 fuel wagons
Smyrna, Del.	...	...	3	...	...	...	...	...	1	...	...	
Daytona, Fla.	...	...	...	...	...	...	2	...	1	...	...	1 hand hose cart.
Fernandina, Fla.	...	...	1	...	1	...	...	...	1	...	...	1 hose reel
Gainesville, Fla.	...	...	2	...	...	...	...	...	1	...	...	1 hand reel
Jacksonville, Fla.	2	...	5	...	3	...	...	...	2	...	...	1 chief's auto, 1 truck in reserve
Ocala, Fla.	...	...	2	...	...	...	1	...	1	...	...	
Orlando, Fla.	4	...	1	...	1	...	...	...	1	...	...	3 reels
Palatka, Fla.	...	...	...	...	...	...	...	...	1a	...	...	6 hose reels
St. Augustine, Fla.	3	...	1	...	...	...	1	...	1	...	2	
Tampa, Fla.	4	...	4	...	2	3	1	...	1	...	3	Chief's auto
Albany, Ga.	1	...	2	...	...	...	...	...	1	...	...	
Athens, Ga.	...	...	2	...	1	...	...	...	1c	...	...	Chief's buggy
Atlanta, Ga.	9	1	9	...	3	1	2	...	6	...	1	Chief's auto and 2 buggies

a Hand drawn.
b Chief's.
c Combination.

FIRE DEPARTMENT STATISTICS—(Continued)

APPARATUS IN SERVICE, NUMBER OF PIECES.

City.	PUMPING ENGINES.		HOSE WAGONS, PLAIN		HOSE WAGONS, COMB.		CHEMICAL ENGINES.		LADDER TRUCKS.		SUPPLY WAGONS	Other Apparatus.
	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	
Bainbridge, Ga.	...	...	2	...	...	...	...	...	...	...	...	
Brunswick, Ga.	1	...	2	...	...	...	...	...	1	...	...	5 extinguishers, 1 chief's buggy
Columbus, Ga.	4	...	2	...	3	...	1	...	1	...	1	
Dawson, Ga.	1	...	2	...	...	...	...	...	1	...	...	
Dublin, Ga.	...	...	...	...	1	...	...	...	1	...	1	Hand fire extinguishers
Elberton, Ga.	...	...	1	...	...	...	...	...	1	...	...	Hand reel
Fitzgerald, Ga.	4	...	1	...	1	...	...	...	...	...	...	
Griffin, Ga.	2	...	1	...	1	...	...	...	1	...	1	2 hand hose reels
Hawkinsville, Ga.	1	...	...	...	1	...	1	...	1	...	3	
La Grange, Ga.	...	...	1	...	...	...	...	...	...	...	...	
Macon, Ga.	4	2	5	...	...	...	1	2	2	...	1	
Newnan, Ga.	...	...	...	...	1	...	...	...	...	...	...	
Rome, Ga.	...	...	5	...	...	1	...	...	1	...	...	Chief's auto, 3 turret pipes
Savannah, Ga.e	7	...	2	...	4	1	1	...	4	..	3	1 pumping engine in reserve
Thomasville, Ga.	1	...	1	...	...	...	...	...	...	...	...	2 3-gallon extinguishers
Tifton, Ga.	...	...	...	...	...	...	...	...	...	...	...	3 hand reels
Waycross, Ga.	...	...	1	...	1	...	...	...	1a	...	...	3 hand reels
Boise, Ida.	2	...	2	...	2	...	2	...	...	...	1	Chief's auto
Lewiston, Ida.	...	...	...	...	...	1	...	...	...	...	...	1 village hook and ladder truck and 6 hose carts hand drawn
Aurora, Ill.	...	...	3	...	2	...	...	...	2	...	...	12 hand chemicals, pumping engine in reserve
Beardstown, Ill.	...	...	...	...	...	...	...	...	1	...	...	3 hose carts
Bloomington, Ill.	2	...	2	1	3	1	2	...	2	...	...	
Blue Island, Ill.	1	...	2	...	1	...	...	...	1	...	...	
Canton, Ill.	2	...	1	...	...	...	1	...	1	...	...	1 hand reel in reserve, 2 horse reels, 1 old ladder truck
Carlinville, Ill.	...	...	...	...	2	...	1	...	1	...	...	
Champaign, Ill.	1	...	2	...	...	...	2	...	1	...	...	7 hand chemicals
Charleston, Ill.	...	...	1	...	1	...	1	...	...	...	...	
Chicago, Ill.	126	...	151	...	...	...	17	...	43	...	151	5 autos for chief and assistants.
Clinton, Ill.	...	...	1	...	...	...	...	...	1	...	...	
Danville, Ill.	...	...	5	...	...	1	2	...	1	...	...	Chief's wagon
De Kalb, Ill.	5	...	...	...	1	...	...	...	...	1	...	1 hose cart
Dixon, Ill.	...	...	1	...	...	...	...	...	1	...	...	3 hose carts
Du Quoin, Ill.	...	...	1	...	...	...	2	...	...	...	...	
East St. Louis, Ill.	2	...	...	...	3	...	...	...	1	...	1	2 hose reels, 1 combination reel, 3 chief's buggies
Elgin, Ill.	...	...	3	...	2	...	...	...	1	...	...	1 hose cart, 5 exercising wagons
Evanston, Ill.	2	1	1	...	...	...	1	...	3	...	...	Chief's buggy
Galena, Ill.	...	...	4	...	1	...	...	...	1	...	...	
Galesburg, Ill.	1	...	1	...	2	...	1	...	1	...	...	Chief's buggy
Harvey, Ill.	1	...	...	...	1	...	...	...	...	...	...	3 hand hose carts
Joliet, Ill.	2	...	4	...	1	...	2	...	2	...	2	1 chief's buggy
Kewanee, Ill.	...	...	1	...	...	...	1	...	...	...	...	
Lincoln, Ill.	5	...	1	...	...	...	1	...	1	...	...	3 hand reels
Macomb, Ill.	...	...	...	...	1	...	3	...	1	...	1	1 hand reel
Marion, Ill.	2	...	...	...	1	...	...	...	...	...	...	
Mattoon, Ill.	...	...	1	...	...	...	1	...	...	...	...	
Metropolis, Ill.	2	...	1	...	...	...	...	...	...	...	...	
Moline, Ill.	...	...	2	...	2	...	...	...	1	...	...	
Monmouth, Ill.	...	...	2	...	1	...	...	...	1	...	...	1 chief's buggy, 1 hose reel
Mt. Vernon, Ill.	2	...	1	...	...	...	...	...	...	...	...	6 hand fire extinguishers, 1 hand hose cart
Murphysboro, Ill.	1	...	...	...	1	...	...	...	..	...	1	2 hose reels
Oak Park, Ill.	...	...	1	...	1	...	...	...	1	...	...	
Peoria, Ill.	2	...	8	...	2	...	1	...	3	...	1	1 steamer, 1 truck, 2 hose carriages, 1 chief's buggy
Pontiac, Ill.	1	...	2	...	...	...	...	...	...	...	...	
Rockford, Ill.	5	1	...	...	7	2	...	...	1	1	2	2 horses and buggies and 1 chief's auto
Sterling, Ill.	...	...	1	...	1	...	...	...	1	...	...	2 hose reels
Streator, Ill.	...	...	...	...	2	...	...	...	...	...	...	
Taylorville, Ill.	...	...	...	...	1	...	1	...	...	...	...	200 ft. ladders
Urbana, Ill.	...	...	1	...	1c	...	...	...	1c	...	...	Chief's buggy
Woodstock, Ill.	...	...	1	...	1	...	...	...	1	...	...	
Anderson, Ind.	...	...	3	...	1	...	...	...	1	...	...	
Bluffton, Ind.	...	...	1	...	1	...	1	...	...	...	1	
Boonville, Ind.	1	...	1	...	...	...	...	...	...	...	...	1 hand truck
Brazil, Ind.	...	...	1	...	1	...	...	...	1	...	...	
Connersville, Ind.	4	...	2	...	1	...	...	...	2	...	1	Chief's wagon
Elkhart, Ind.	...	1	3	...	1	...	...	...	1	...	1	
Elwood, Ind.	...	...	1	...	...	...	...	...	2	...	...	
Evansville, Ind.	5	...	10	...	2	...	1	...	2	...	2	
Frankfort, Ind.	...	...	1	...	...	...	...	...	...	...	...	5 ladders
Greenville, Ind.	...	...	1	...	...	...	...	...	1	...	...	
Hammond, Ind.	2	...	2	...	3	...	5	...	2	...	...	10 chemical hand extinguishers
Huntington, Ind.	2	...	...	...	2	...	...	...	1	...	...	4 interchangeable hose beds
Indianapolis, Ind.	11	...	26	...	...	...	3	...	10	...	1	Water tower, auto squad
Lafayette, Ind.	1	...	4	...	...	...	1	...	1	...	...	One 1-horse reel
La Porte, Ind.	...	...	1	...	...	1	...	...	1	...	...	1 hand reel, 4 1-horse reels, and 1 1-horse truck in reserve
Logansport, Ind.	1	...	...	...	3	...	...	...	1	...	...	1 fire engine in reserve
Marion, Ind.	...	...	3	...	2	...	...	...	1	...	...	1 hose reel
Michigan City, Ind.	2	...	...	...	2	...	...	...	1	...	...	3 hose carts
Montpelier, Ind.	...	...	1	...	...	...	1	...	1	...	...	2 reels
Mt. Vernon, Ind.	...	...	...	...	1	...	...	...	1	...	...	Hand reel
Muncie, Ind.	2	...	...	...	3	...	...	...	1	...	...	1 extra hose wagon
North Vernon, Ind.	1	...	...	...	1	...	...	...	...	...	...	
Peru, Ind.	...	...	1	...	1	...	...	...	1	...	...	
Plymouth, Ind.	...	...	...	...	1	...	1	...	1	...	...	2 hand hose carts
Portland, Ind.	...	...	1	...	1	...	1	...	...	...	...	4 6-gallon extinguishers
Richmond, Ind.	1	...	2	...	4	...	...	...	1	...	1	2 chief's wagons
Shelbyville, Ind.	...	...	2	...	...	...	...	...	1	...	...	
Tell City, Ind.	2	...	6	...	...	...	...	...	1	...	...	Hooks and axes
Terre Haute, Ind.	3	...	5	...	5	...	...	...	3	...	1	1 hose wagon and 1 hose reel in reserve
Valparaiso, Ind.	1	...	1	...	...	...	...	...	1	...	1	
Vincennes, Ind.	...	...	1	...	2	1	...	...	1	...	...	1 hose cart in reserve
Washington, Ind.	4	...	1	...	1	...	...	...	...	...	...	4 hand extinguishers
Winchester, Ind.	...	...	2	...	...	...	...	...	1	...	...	7 reels

a Hand drawn.
c Combination.
e This department in the next six months will be entirely motor driven except trucks. 7 steamers, 3 combinations and 1 chemical to be delivered.

FIRE DEPARTMENT STATISTICS—(Continued)

APPARATUS IN SERVICE, NUMBER OF PIECES.

City.	PUMPING ENGINES.		HOSE WAGONS, PLAIN		HOSE WAGONS, COMB.		CHEMICAL ENGINES.		LADDER TRUCKS.		SUPPLY WAGONS	Other Apparatus.
	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	
Albia, Ia.	1	...	1	...	...	...	1	...	1	...	...	
Algona, Ia.	2	...	1	...	...	...	...	...	1	...	...	
Burlington, Ia.	...	...	7	...	1	...	1	...	1	...	...	1 chief's buggy
Cedar Rapids, Ia.	...	...	4	...	1	...	...	...	2	...	1	1 chief's auto
Charles City, Ia.	...	...	1	...	...	...	...	...	1	...	...	
Creston, Ia.	...	...	1	...	1	...	1	...	1	...	...	
Des Moines, Ia.	...	...	10	...	5	...	3	...	5	...	...	1 chief's auto, 3 chief's buggies
Dubuque, Ia.	4	...	3	...	3	...	1	...	2	...	1	
Fort Dodge, Ia.	...	...	1	...	1	...	...	...	2	...	...	3 hose reels
Fort Madison, Ia.	...	...	6a	...	...	...	...	...	...	...	...	1 steamer engine in reserve, 1 service wagon
Grinnell, Ia.	1	...	...	...	...	...	...	...	1	...	...	2 hand chemicals, 3 hose carts, hand drawn
Iowa City, Ia.	...	...	1	...	...	...	...	...	1	...	...	2 hand carts
Marion, Ia.	4	...	...	...	...	...	...	...	1	...	...	
Marshalltown, Ia.	...	...	...	...	2	...	...	...	1	...	...	
Mason City, Ia.	...	...	1	...	1	...	...	...	1	...	...	Hose cart
Muscatine, Ia.	...	...	...	...	...	...	...	...	1	...	...	10 hose carts
Sioux City, Ia.	1	...	5	...	2	...	3	...	2	...	5	1 4-wheel cart in reserve
Waterloo, Ia.	1	...	...	...	2	...	1	...	1	...	...	Chief's auto
Atchison, Kan.	2	1	3	...	1	...	...	1	1	...	...	1 chief's buggy
Coffeyville, Kan.	...	...	2	...	...	...	...	...	1	...	...	Chief's wagon
Girard, Kan.	2	...	2	...	2	...	1	...	1	...	1	
Hutchison, Kan.	...	...	1	...	...	1	...	...	1	...	...	
Independence, Kan.	...	...	2	...	1	...	...	...	...	...	...	
Kansas City, Kan.	3	...	5	...	2	...	1	...	2	...	1	1 chief's auto, 2 chief buggies
Lawrence, Kan.	...	...	2	...	...	...	...	...	1	...	...	40 gal. chemical attached to truck
Leavenworth, Kan.	...	...	1	...	1	...	...	...	2	...	...	Chief's auto
Manhattan, Kan.	2	...	...	...	...	1	...	...	...	...	...	1 hose cart
Newton, Kan.	...	...	...	...	1	...	...	...	1	...	...	1 hose reel
Ottawa, Kan.	1	...	2	...	...	...	...	...	1	...	...	2 hand reels
Parsons, Kan.	...	...	1	...	1	...	...	...	1	...	...	Chief's rig
Salina, Kan.	...	...	...	...	1	...	...	...	1	...	...	1 chief's auto, 2-way wagon pipe
Topeka, Kan.	2	...	5	...	2	...	2	...	2	...	...	Chief's wagon, fire alarm repair wagon
Winfield, Kan.	...	...	1	...	...	...	6a	...	1	...	...	
Ashland, Ky.	...	...	2	...	...	...	1	...	...	...	...	
Bellevue, Ky.	...	...	...	...	1	...	...	...	...	...	...	4 3-gal. chemicals, 1 hand hose reel
Bowling Green, Ky.	...	...	...	...	2	...	...	...	1	...	...	Chief's buggy and 2 hand drawn reels
Covington, Ky.	3	...	6	...	2	...	1	...	1	...	...	
Cynthiana, Ky.	1	...	1	...	...	...	...	...	...	...	...	
Danville, Ky.	...	...	1	...	...	...	3	...	1	...	...	1 hose reel
Frankfort, Ky.	...	...	2	...	...	...	...	...	1	...	...	
Lexington, Ky.	...	1	3	...	3	...	1	...	1	...	1	
Louisville, Ky.	21	...	17	...	4	...	...	...	6	...	6	4 hose reels, 2 engines, 1 hook and ladder, 1 fuel wagon, all extra
Newport, Ky.	...	...	3	...	...	...	...	...	1	...	...	7 hand chemicals
Paducah, Ky.	1	...	1	...	4	...	...	...	1	...	1	65 ft. H. & L. truck
Richmond, Ky.	...	...	1	...	...	...	...	...	...	...	...	
Shelbyville, Ky.	1	...	1	...	...	1	...	...	...	...	...	3 hand hose carts
Somerset, Ky.	...	...	1	...	...	...	...	...	...	...	...	2 hand hose reels
Baton Rouge, La.	...	...	4	...	...	...	...	...	1	...	...	
Crowley, La.	4	...	3	...	...	...	...	...	1	...	...	
Donaldsville, La.	...	...	3	...	...	...	1	...	1	...	...	1 reel
New Orleans, La.	31	...	27	...	1	...	10	...	9	...	5	1 water tower, 1 chief's auto, 8 fire buggies
Opelousas, La.	2	...	1	...	...	...	...	...	1	...	...	
Shreveport, La.	3	...	1	...	4	...	...	...	1	...	2	3 autos
Auburn, Me.	2	...	3	...	1	...	...	...	1	...	...	2 hose reels
Biddeford, Me.	3	...	2	...	1	...	...	...	1	...	1	
Calais, Me.	1	...	3	...	...	...	...	...	1	...	...	
Eastport, Me.	...	...	2	...	...	...	...	...	1	...	1	6 hand chemicals
Gardiner, Me.	3	...	7	...	...	...	...	...	1	...	...	
Portland, Me.	8	1	10	...	...	...	1	...	2	...	9	3 comb. trucks and chemicals, 1 aerial truck, 1 fire-boat
Rockland, Me.	2	...	3	...	...	...	...	...	1	...	...	
Rumford, Me.	...	...	...	...	1	...	1	...	1	...	...	5 hose reels
Saco, Me.	2	...	1	...	...	...	...	...	1	...	1	2 reels, 4 pony chemicals
Waterville, Me.	1	...	4	...	...	...	...	...	1	...	2	
Annapolis, Md.	1	1	2	...	...	...	...	...	1	...	...	3 hand reels
Baltimore, Md.	39	...	...	...	39	...	17	...	1	...	...	2 water towers, 2 fire-boats, 2 officer's autos
Cumberland, Md.	...	...	...	...	3	...	3	...	1	...	...	2 hose carts
Adams, Mass.	...	...	1	...	1	...	...	...	2	...	...	4 hose carts
Amherst, Mass.	1	...	3	...	...	...	...	...	1	...	...	30 hand chemicals
Andover, Mass.	1	...	3	...	...	...	...	...	10	...	...	8 hand chemicals
Attleboro, Mass.	...	...	3	...	1	1	...	...	3	...	3	3 hose reels
Beverly, Mass.	3	...	6	...	...	...	1	...	3	...	1	
Boston, Mass.	44	...	44	...	...	...	12	2	27	...	3	3 fire-boats, 3 water towers, 1 wrecking wagon, 4 autos for chiefs, 1 salt water high service wagon
Bridgewater, Mass.	1	...	2	...	...	...	...	...	1	...	2	1 wagon with hand chemicals, etc.
Brockton, Mass.	6	...	6	...	...	...	2	...	3	...	5	Chief's auto, 2 hose reels
Brookline, Mass.	2	...	3	...	4	...	1	1	2	...	2	1 chief's auto
Cambridge, Mass.	7	...	5	...	2	...	2	...	4	...	1	
Chelsea, Mass.	4	...	4	...	1	...	1	...	1	...	6	1 reserve pumping-engine, 1 reserve ladder truck
Chicopee, Mass.	9	...	1	...	1	1	...	...	3	...	2	1 chief's buggy, 1 steam fire engine
Concord, Mass.	...	...	1	...	...	2	...	...	2	...	...	2 hose wagons
Everett, Mass.	2	...	3	...	...	...	1	...	2c	...	3	Chief's buggy
Fall River, Mass.	5	...	8	...	2	1	3	...	5	...	1	1 flying squad
Fitchburg, Mass.	2	...	3	...	2	...	1	...	3	...	2	Extra truck, 2 hose wagons
Franklin, Mass.	2	...	1	...	...	...	...	...	1	...	...	4 hand hose reels, forest fire wagon
Gloucester, Mass.	6	...	6	...	3	...	2	...	3	...	2	1 fire-boat

a Hand drawn.
c Combination.

FIRE DEPARTMENT STATISTICS—(Continued)

APPARATUS IN SERVICE, NUMBER OF PIECES.

City.	PUMPING ENGINES.		HOSE WAGONS, PLAIN		HOSE WAGONS, COMB.		CHEMICAL ENGINES.		LADDER TRUCKS.		SUPPLY WAGONS	Other Apparatus.
	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	
Great Barrington, Mass.	1	...	6	...	...	...	1	...	1	...	...	
Greenfield, Mass.	1	...	2	...	2	1	...	...	1	...	1	
Haverhill, Mass.	5	...	5	1	...	1	3	...	3	...	3	
Hingham, Mass.	1	...	2	...	2	...	...	...	1	...	...	1 hook and ladder
Holyoke, Mass.	7	...	5	...	1	1	2	1c	3	...	5	1 chief's car
Lawrence, Mass.	4	...	4	...	4	...	2	..	4	...	4	1 water tower
Lee, Mass.	2	...	6	...	...	...	1	...	1	...	1	2 hand engines, 11 pumps
Lowell, Mass.	6	...	12	...	...	1	2	...	4	...	11	1 water tower, 1 auto for chief
Lynn, Mass.	6	...	6	...	1	1	2	...	4	...	10	1 chief's auto, 2 chief's buggies, 1 auto squad. In reserve, 4 engines, 2 wagons, 1 ladder truck
Malden, Mass.	2	...	1	...	3	1	3	...	2	...	6	Fire alarm wagon and chief's buggy
Marblehead, Mass.	2	...	2	...	...	...	...	...	1	...	2	3 hand reels
Marlborough, Mass.	...	...	3	...	1	...	...	...	1	...	2	4 winter sleighs
Medford, Mass.	1	...	2	...	3	...	1	...	1	...	5	1 hose wagon, 5 sleighs
New Bedford, Mass.	7	1	6	...	3	2	...	...	3	...	...	1 ladder truck, 1 steam engine, 3 hose wagons (reserve)
Newton, Mass.	3	...	4	...	3	1	1	...	2	...	6	2 chief's autos
Orange, Mass.	1	...	1	...	1	...	...	...	1	...	...	2 hand reels, 11 extinguishers
Peabody, Mass.	2	...	6	...	1	...	1	...	1	...	1	20 pony chemical engines, 1 hand drawn chemical
Quincy, Mass.	1	...	5	...	3	1	...	...	3	...	...	
Reading, Mass.	1	...	5	...	...	...	...	...	1	...	...	
Revere, Mass.	2	...	1	...	3	...	...	...	1	...	3	
Somerville, Mass.	4	...	3	...	4	1	1	...	3	...	8	
Springfield, Mass.	8	...	1	...	6	3	2	...	3	1	...	1 trolley transportation car
Swampscott, Mass.	1	1	1	...	...	...	1	...	1	...	2	Sleigh
Taunton, Mass.	3	...	3	...	3	...	1	...	4	...	4	3 hand hose reels
Turners Falls, Mass.	...	...	5	...	1	...	6	...	1	...	1	
Wakefield, Mass.	...	...	2	1	1	...	...	...	1	...	1	2 steam engines
Waltham, Mass.	2	...	4	...	1	...	1	...	2	...	1	
Watertown, Mass.	1	...	2	...	1	...	...	...	1	...	1	
Webster, Mass.	1	...	4	...	...	1	...	...	1	...	1	
Wellesley, Mass.	...	...	3	...	...	...	...	...	1	...	...	
Winthrop, Mass.	1	...	2	...	1	1	1	...	1	...	...	
Woburn, Mass.	1	...	6	...	...	...	...	...	1	...	1	
Worcester, Mass.	8	...	8	1	3	...	2	...	7	...	2	3 chief's buggies, 1 auto.
Adrian, Mich.	...	...	1	...	2	...	...	...	1c	...	1	1 pumping engine in reserve
Alpena, Mich.	2	...	2	...	1	...	...	...	1	...	...	
Ann Arbor, Mich.	1	...	2	...	1	...	...	...	2	...	1	
Battle Creek, Mich.	2	...	1	...	4	1	...	...	1	...	...	Chief's auto
Bay City, Mich.	3	...	10	...	1	...	2	...	3	...	...	3 chief's buggies
Cadillac, Mich.	...	...	1	...	...	...	...	...	1	...	1	
Charlotte, Mich.	...	...	1	...	...	...	...	...	1	...	1	
Flint, Mich.	1	...	3	...	1	1	...	...	2	...	1	1 auto with chemical tank and hose
Grand Haven, Mich.	1	...	2	...	1	...	...	...	1	...	...	1 reel wagon
Grand Rapids, Mich.	11	...	10	1	...	...	2	...	3	...	1	1 engine, 2 trucks, 1 hose wagon
Hancock, Mich.	1	...	2	...	...	...	1	...	1	...	...	
Hastings, Mich.	...	...	...	...	1	...	...	...	1	...	...	2 supply carts
Holland, Mich.	...	...	...	...	2	...	...	...	...	...	...	4 hand chemicals
Houghton, Mich.	1	...	2	...	...	...	...	...	1	...	...	
Ironwood, Mich.	...	...	2	...	...	...	...	...	1	...	...	4 hand hose carts
Kalamazoo, Mich.	3	...	1	...	5	...	...	...	2	...	1	1 truck in reserve
Lansing, Mich.	...	2	...	...	2	1	1	...	1	...	...	1 chief's car
Laurium, Mich.	1	...	1	...	...	...	...	...	1	...	1	
Ludington, Mich.	...	...	3	...	1	...	...	...	1	...	...	
Manistique, Mich.	2	...	1	...	...	...	...	...	1	...	...	2 hand chemicals
Menominee, Mich.	1	...	3	...	...	...	...	...	1	...	2	Fire-boat and portable chemicals
Monroe, Mich.	1	...	2	...	...	...	...	...	1	...	...	
Mt. Pleasant, Mich.	...	...	2a	...	1	...	...	...	1	...	...	
Muskegon, Mich.	1	...	2	...	4	...	...	...	1	...	...	1 ladder truck and 1 aerial truck in reserve
Norway, Mich.	...	...	1	...	1	...	...	...	1	...	...	
Owosso, Mich.	1	...	1	...	1	...	...	...	1	...	...	
Pontiac, Mich.	2	...	2	...	1	...	...	...	2	...	1	Chief's buggy
St. Clair, Mich.	...	...	3	...	...	...	...	...	1	...	1	
St. Joseph, Mich.	1	...	1	...	...	...	...	...	1	...	...	1 hand hose cart, 2 hand chemicals
Saginaw, Mich.	1	...	10	...	...	...	...	...	2	...	...	1 steamer, 1 truck in reserve
South Haven, Mich.	...	...	...	...	1	...	...	...	...	...	...	
Traverse City, Mich.	2	...	...	...	2	...	...	...	2	...	1	4 hand drawn hose carts, 4 hand chemicals
Albert Lea, Minn.	...	...	1	...	1	...	...	...	1	...	...	
Alexandria, Minn.	...	...	...	...	...	...	2	...	1	...	...	3 hose carts
Anoka, Minn.	1	...	1	...	...	...	1	...	1	...	1	
Austin, Minn.	2	...	...	...	1	...	...	...	1	...	...	4 hose carts
Bemidji, Minn.	1	...	2	...	...	...	...	...	1	...	...	6 chemicals
Cloquet, Minn.	4	...	2	...	...	...	1	...	1	...	...	6 hand extinguishers
Crookston, Minn.	...	...	1	...	1	...	1	...	1	...	...	3 hand hose reels in reserve, 1 hand drawn H. & L. truck
Ely, Minn.	...	...	...	...	...	...	1	...	1	...	1	3 hose carts
Eveleth, Minn.	...	...	1	...	1	...	1	...	1	...	1	
Faribault, Minn.	...	...	1	...	...	...	1	...	1	...	1	3 hose carts
Hastings, Minn.	1	...	...	...	...	...	...	...	1	...	...	3 hose carts
Mankato, Minn.	...	...	3	...	...	...	...	...	1	...	1	4 hand reels, 1 chemical, 2 H. & L trucks
Minneapolis, Minn.	24	...	7	...	16	2	8	...	11	1	...	6 carriage reels, 2 horse-shoeing wagons, 1 chief's auto
New Ulm, Minn.	1	...	2	...	...	...	...	...	2d	...	1	
Owatonna, Minn.	3	...	1	...	1	...	...	...	1	...	...	3 hose carts
Red Wing, Minn.	2	...	2	...	1	...	...	...	1	...	1	1 chief's buggy
Rochester, Minn.	...	...	2	...	...	...	...	...	1	...	...	Expect to install combination auto
St. Cloud, Minn.	...	...	1	...	...	...	...	...	1	...	...	1 hand hose cart
St. Paul, Minn.	21	...	23	...	1	...	3	...	10	...	5	1 water tower, 4 chief's autos
Stillwater, Minn.	2	...	2	...	...	...	...	...	1	...	...	
Two Harbors, Minn.	...	...	1	...	1	...	1	...	1	...	1	
Willmar, Minn.	1	...	...	...	...	...	...	...	2	...	...	3 hose carts
Winona, Minn.	2	...	4	...	...	...	1	...	2	...	...	3 supply hose carts
Aberdeen, Miss.	1	...	1	...	...	...	...	...	1	...	...	
Jackson, Miss.	2	...	2	...	2	...	...	...	2	...	...	Chief's buggy

a Hand drawn.
c Combination.
d Aerial.

FIRE DEPARTMENT STATISTICS—(Continued)

APPARATUS IN SERVICE, NUMBER OF PIECES.

City.	PUMPING ENGINES.		HOSE WAGONS, PLAIN		HOSE WAGONS, COMB.		CHEMICAL ENGINES.		LADDER TRUCKS.		SUPPLY WAGONS	Other Apparatus.
	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	
Meridian, Miss.	...	...	3	...	2	...	...	...	1	...	...	1 chief's and 1 lineman's buggy, 3 engines in reserve, 1 truck in reserve
Natchez, Miss.	2	...	2	...	1	...	...	...	1	...	...	6 hand hose reels
West Point, Miss.	...	...	1	...	1	...	...	...	...	...	...	
Yazoo City, Miss.	1	...	2	...	1	...	...	...	1	...	...	2 hose reels
Aurora, Mo.	...	...	...	...	...	...	...	...	1a	...	...	3 hose carts
Brookfield, Mo.	...	...	1	...	...	...	...	...	...	...	...	
Cape Girardeau, Mo.	2	...	...	...	1	...	...	...	...	...	...	
Carthage, Mo.	...	...	1	...	...	...	...	...	1	...	...	1 hand chemical extinguisher, 1 hand hose reel
Clinton, Mo.	1	...	1	...	...	...	...	...	...	...	...	
Columbia, Mo.	...	...	1	...	...	...	...	...	...	...	...	2 chemical tanks. .
De Soto, Mo.	...	...	1	...	...	...	...	...	1	...	...	2 hand pumping engines
Fulton, Mo.	...	...	...	...	1	...	...	...	...	...	...	1 hose supply reel
Hannibal, Mo.	...	...	...	...	...	...	...	...	1	...	...	3 hose carriages
Kansas City, Mo.	10	...	22	...	2	...	1	...	8	...	4	Water tower, turret wagon and 2 chief's autos
Kirksville, Mo.	2	...	1	...	...	...	3	...	...	...	1	1 hand truck
Mexico, Mo.	...	...	...	...	1	...	...	...	...	...	...	4 chemicals
Poplar Bluff, Mo.	...	...	1	...	...	...	...	...	...	...	...	Small extension ladders
St. Louis, Mo.	49	1	8	...	39	...	...	...	17	...	1	11 fuel wagons, 2 water towers, 13 officer's wagons, 2 double hose wagons
Springfield, Mo.	2	...	...	...	...	...	...	...	2	...	1	2 hose reels, 1 chief's auto
St. Charles, Mo.	4	...	2	...	...	...	...	...	1	...	...	
Warrensburg, Mo.	...	...	3	...	...	...	...	...	...	...	...	1 hand hose wagon
Billings, Mont.	...	...	2	...	...	...	...	1	1c	...	1	
Bozeman, Mont.	1	...	...	...	...	1	...	...	1	...	...	
Helena, Mont.	...	...	1	...	1	...	...	...	1	...	...	1 pumping engine and 1 ladder truck in reserve. 1 chief's buggy
Kalispell, Mont.	...	...	...	...	1	...	...	...	1	...	...	
Missoula, Mont.	2	...	2	...	...	...	2	...	1	...	...	Auto combination hose and chem.
Red Lodge, Mont.	...	...	...	...	1	...	...	...	...	...	...	
Beatrice, Nebr.	...	...	...	...	1	...	...	...	2	...	...	4 carts
Columbus, Nebr.	...	...	...	...	...	1	...	...	1	...	...	3 hose carts, 1 reserve hose cart
Grand Island, Nebr.	...	...	...	...	...	1	...	...	1	...	...	4 hose carts
Hastings, Nebr.	...	...	...	...	...	...	...	...	1	...	...	1 hose reel
Lincoln, Nebr.	2	...	4	...	...	...	1	...	3	...	...	Auto for chief, auto combination contracted for
Nebraska City, Nebr.	...	...	...	...	2	...	...	...	1	...	...	2 hand carts, 4 chemicals
Norfolk, Nebr.	...	...	...	...	1	...	1	...	1	...	1	
North Platte, Nebr.	...	...	1	...	...	...	...	...	1	...	...	4 hose carts
Omaha, Nebr.	4	...	8	...	1	1	2	...	5	...	1	4 hose wagons with monitor nozzle, 2 assist. chief's buggies, 1 auto for chief
South Omaha, Nebr.	1	...	2	...	1	...	...	...	1	...	...	
Franklin, N. H.	1	...	2	...	...	...	...	...	1	...	...	1 hand tub, 4 hand reels, 1 hand ladder truck
Laconia, N. H.	1	...	3	...	2	...	...	...	3	...	1	
Manchester, N. H.	7	...	10	...	3	1	1	...	5	...	1	
Nashua, N. H.	4	...	4	...	...	...	1	...	2	...	...	
Portsmouth, N. H.	4	...	4	...	1	...	...	...	1	...	1	
Atlantic City, N. J.	11	...	4	...	8	...	1	...	4	...	8	2 asst. chief's wagon, 1 auto for chief engineer
Bayonne, N. J.	6	...	3	...	3	...	...	...	2	...	1	1 truck, 1 hose wagon, 1 hose reel
Bordentown, N. J.	1	...	...	...	...	...	1a	...	1a	...	...	4 hand hose wagons
Burlington, N. J.	2	...	6	...	...	...	1	...	1	...	...	Salvage corps patrol
Camden, N. J.	7	...	1	...	7	...	1	...	3	...	1	1 extra pumping engine, 1 extra hose carriage
East Orange, N. J.	...	...	...	...	...	...	5	...	2	...	7	1 extra
Elizabeth, N. J.	6	...	4	...	2	...	...	...	2	...	1	1 chief's auto, 1 engine in reserve, 3 hose carriages, 1 truck
Hackensack, N. J.	2	...	2	...	2	1	...	...	2	...	1	1 fire patrol
Hoboken, N. J.	5	...	2	...	3	...	1	...	2	...	2	2 extra pumping engines, 1 extra hook and ladder
Irvington, N. J.	...	...	1	...	...	1	...	...	1	...	...	
Jersey City, N. J.	18	...	10	...	9	...	2	...	8	...	1	1 auto
Kearny, N. J.	...	...	3	...	1	...	...	...	2	...	...	1 chief's auto with chemical
Long Branch, N. J.	3	...	6	...	1	1	1	...	2	...	1	
Millville, N. J.	...	...	2	...	...	...	...	...	1	...	...	1 hand hose carriage, 2 hand hose reels
Montclair, N. J.	...	...	3	...	2	...	...	...	2	...	3	
Morristown, N. J.	2	...	3	...	...	...	...	1	1	...	1	1 auto ladder truck ordered
Newark, N. J.	21	1	3	...	19	...	...	...	8	...	1	3 engines, 2 combination hose wagons, 2 trucks in reserve
Passaic, N. J.	3	1	1	...	2	2	...	...	...	2	1	1 pumping engine in reserve
Paterson, N. J.	9	1	4	...	3	2	...	1	3	...	1	2 auto engines ordered
Perth Amboy, N. J.	3	...	2	...	3	...	...	...	2	...	...	Chief's wagon
Phillipsburg, N. J.	1	...	3	...	...	...	1	...	1	...	...	
Plainfield, N. J.	1	...	2	...	2	...	1	...	1	...	2	Chief's auto
South Amboy, N. J.	1	...	3	...	...	...	1	...	1	...	1	
Summit, N. J.	...	...	2	...	...	...	...	1	1	...	...	
West Hoboken, N. J.	1	...	2	...	1	...	...	...	3	...	...	1 hand hose carriage
Westfield, N. J.	...	...	2	...	...	...	1	...	1	...	...	
Albuquerque, N. M.	...	...	...	...	2	...	...	...	...	...	...	1 service truck, 1 old hose wagon
E. Las Vegas, N. M.	4	...	1	...	1	...	1	...	1	...	...	
Roswell, N. M.	1	...	1	...	1	...	...	...	1	...	...	Chief's buggy and horse
Amsterdam, N. Y.	10	...	...	...	4	...	...	...	1	...	...	1 engine, 3 hose carts
Auburn, N. Y.	2	...	2	...	3	1	...	...	2	...	1	
Batavia, N. Y.	...	...	5a	...	...	...	1a	...	2	...	...	
Binghamton, N. Y.	3	...	3	...	4	...	...	...	2	...	3	Chief's auto
Corning, N. Y.	...	...	1	...	1	...	...	...	2	...	1	4 jumpers
Cortland, N. Y.	1	...	1	...	1	...	...	...	1	...	...	3 hose carts
Dansville, N. Y.	...	...	4a	...	...	...	1a	...	1a	...	...	
Elmira, N. Y.	7	...	...	...	4	...	...	...	2	...	1	1 combination wagon
Fulton, N. Y.	2	...	2	...	...	...	...	...	1	...	1	4-stream flooding set
Gloversville, N. Y.	...	...	1	...	2	...	...	...	1	...	1	2 hose carts

a Hand drawn
c Combination.

FIRE DEPARTMENT STATISTICS—(Continued)

APPARATUS IN SERVICE, NUMBER OF PIECES.

City.	PUMPING ENGINES.		HOSE WAGONS, PLAIN		HOSE WAGONS, COMB.		CHEMICAL ENGINES.		LADDER TRUCKS.		SUPPLY WAGONS	Other Apparatus.
	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	
Herkimer, N. Y.	...	...	...	...	...	...	...	...	1a	...	...	4 hose carts
Hoosick Falls, N. Y.	1	...	4	...	...	...	...	...	1	...	...	
Hornell, N. Y.	...	...	3	...	1	...	...	...	1	...	1	3 hand carts
Hudson, N. Y.	...	...	5	...	...	...	1	...	1	...	...	
Ithaca, N. Y.	2	...	2	...	4	...	...	...	2	...	1	7 hand carts in reserve, expect to purchase auto combination
Jamestown, N. Y.	2	...	3	...	2	1	3	...	2	...	...	
Johnstown, N. Y.	...	...	1	...	...	...	...	...	1	...	...	4 hose carts, 1 deluge set
Little Falls, N. Y.	...	...	4	...	...	...	...	...	1	...	...	1 reel
Malone, N. Y.	4	1	2	...	...	...	1	...	1	...	1	
Mamaroneck, N. Y.	1a	...	4a	...	...	...	...	...	1a	...	1a	Patrol
Middletown, N. Y.	1	...	1	...	1	1	...	...	2	...	1	5 hose carts
Newburgh, N. Y.	4	...	5	...	1	...	1	...	1	...	...	1 auto
New Rochelle, N. Y.	3	...	2	...	4	...	...	...	2	...	1	Chief's wagon
North Tonawanda, N. Y.	1	...	7	...	...	...	...	...	1	...	1	H. & L. sleigh, 6 hose sleighs, 16 chemicals
Ogdensburg, N. Y.	2	...	1	...	2	...	...	...	1	...	...	
Oneida, N. Y.	1	...	1	...	1	...	...	...	1	...	...	2 hose sleighs
Oneonta, N. Y.	2	...	1	...	1	...	...	...	1	...	...	1 hand hose reel
Oswego, N. Y.	3	...	2	...	1	...	2	...	2	...	2	
Owego, N. Y.	1	...	4a	...	...	...	1	...	1	...	...	
Peekskill, N. Y.	...	1	1	1	2	...	...	...	1	...	...	
Port Chester, N. Y.	2	...	2	...	2	...	2	...	2	...	...	1 police patrol
Rensselaer, N. Y.	...	...	1	...	4	...	...	...	2	...	2	
Rochester, N. Y.	15	...	6	...	13	...	...	...	7	...	2	1 water tower, 1 chief's auto, 5 chief's wagons
Rome, N. Y.	3	...	1	...	2	...	...	...	1	...	2	Chief's wagon
Saratoga Springs, N. Y.	...	...	3	...	...	...	...	1	1	...	2	1 reserve pumping engine, 1 hose carriage reserve
Schenectady, N. Y.	4	...	2	...	7	...	...	...	2	...	5	1 Deputy chief's wagon, 1 chief's auto, 2 mounted boat pipes on wheels
Syracuse, N. Y.	10	...	9	...	3	...	...	...	5	...	1	Water tower
Troy, N. Y.	11	...	4	...	9	...	...	...	3	...	13	1 ladder truck in reserve, chief's buggy.
Utica, N. Y.	6	...	4	...	4	...	1	...	3	...	1	
Waverly, N. Y.	...	...	3a	...	...	...	...	...	1a	...	3a	
Westfield, N. Y.	...	...	3a	...	...	...	...	...	1a	...	...	
Yonkers, N. Y.	...	1	2	...	7	2	1	...	4	...	...	6 hose carriages
Charlotte, N. C.	1	...	1	...	3	...	...	...	1	...	...	Chief's buggy
Durham, N. C.	1	...	...	...	2	...	...	...	1	...	1	
Elizabeth City, N. C.	2	...	2	...	...	...	...	...	1	...	...	2 horse hose reels
Greensboro, N. C.	2	...	3	...	1	...	...	...	1	...	...	
Henderson, N. C.	...	...	2	...	1	...	...	...	1	...	...	4 hand reels not in service
Kinston, N. C.	3	...	1	...	...	...	...	...	1	...	...	
Raleigh, N. C.	1	...	3	...	...	...	...	...	1	...	...	
Reidsville, N. C.	1	...	1	...	...	...	...	...	1	...	...	10 chemical extinguishers
Salisbury, N. C.	1	...	1	...	...	...	...	...	1	...	1	2 reels
Washington, N. C.	...	...	1	...	2	...	...	...	1	...	2	1 steam engine
Winston-Salem, N. C.	2	...	4	...	...	...	...	...	2	...	1	1 reserve engine
Dickinson, N. D.	1	...	...	...	...	...	...	...	1	...	...	3 hose carts
Grand Forks, N. D.	1	...	2	...	1	...	...	...	1	...	1	3 hose and 1 truck sleigh
Valley City, N. D.	...	...	1	...	...	...	...	...	1	...	...	2 hose carts
Akron, Ohio	5	3	1	...	7	...	...	...	2	...	3	1 fire engine, 1 hose cart, 1 combination hose wagon in reserve. 1 chief's car, 2 extinguishers
Alliance, Ohio	...	1	...	...	1	1	...	...	...	...	...	1 hose wagon in reserve
Ashtabula, Ohio	2	...	4	...	...	...	1	...	1	...	...	2 autos ordered
Barberton, Ohio	...	2	...	...	2	...	...	...	1	...	...	3 hand carts
Bellaire, Ohio	...	...	...	...	1	...	3a	...	1	...	...	1 hand ladder truck, 5 hand hose carriages, 1 chief's buggy. Expect to purchase two autos
Bellefontaine, Ohio	...	...	2	...	...	...	...	...	1	...	...	1 comb. hose and police wagon
Bucyrus, Ohio	1	...	2	...	...	1	...	...	1	...	...	1 hand hose reel
Chillicothe, Ohio	...	...	1	...	2	...	...	...	1	...	...	1 fire engine in reserve
Cincinnati, Ohio	36	...	40	...	7	...	1	...	16	...	3	2 water towers, 1 tool wagon
Circleville, Ohio	...	...	1	...	1	...	...	...	...	...	...	1 hose cart, 4 fire extinguishers
Cleveland, Ohio	31	...	29	...	3	...	3	...	11	...	4	2 chief's autos, 3 extra engines, 5 extra wagons, 12 chief's buggies
Columbus, Ohio	18	...	7	...	13	...	1	...	8	...	6	1 water tower, 3 chief's autos
Conneaut, Ohio	...	...	2	...	1	...	...	...	1	...	...	1 relief cart
Defiance, Ohio	1	...	1	...	...	...	...	...	1c	...	...	3 hand hose carts
Dennison, Ohio	...	...	...	...	...	...	1a	...	1a	...	...	8 hand hose reels
East Cleveland, O.	...	...	...	...	1	...	...	...	...	...	...	
East Liverpool, Ohio	1	...	1	...	3	...	...	...	1	...	...	2 hose reels
Eaton, Ohio	1	...	1	...	...	...	...	...	1	...	...	1 hose reel
Elyria, Ohio	1	...	...	...	3	...	...	...	1	...	1	Ordered 2 auto combination pumping engines and hose wagons
Findlay, Ohio	1	...	2	...	...	...	1	...	1	...	...	
Galion, Ohio	1	...	1	...	2	...	2	...	1	...	1	2 2-wheel carts
Gallipolis, Ohio	...	...	2	...	...	...	...	...	1	...	...	
Greenfield, Ohio	...	...	...	...	...	...	1	...	1	...	...	
Greenville, Ohio	1	...	1	...	1	...	...	...	...	...	...	
Hillsboro, Ohio	1	...	1	...	...	...	...	...	1	...	...	
Jackson, Ohio	1	...	1	...	...	...	...	...	...	...	2	4 hand chemicals on hose wagon
Kenton, Ohio	...	...	2	...	...	...	...	...	1	...	...	
Lancaster, Ohio	1	...	1	...	2	...	...	...	...	...	...	
Lorain, Ohio	3	...	2	...	5	...	5	...	1	...	2	
Mansfield, Ohio	1	...	3	...	1	...	1	...	1	...	...	
Marion, Ohio	1	...	1	...	2	...	...	...	1	...	...	
Massillon, Ohio	1	...	...	...	3	...	...	...	1	...	...	Chief's auto, 1 hose carriage in reserve. 10 hand chemicals
Miamisburg, Ohio	1	...	1	...	1	...	...	...	1	...	...	
Mt. Vernon, Ohio	...	...	2	...	...	...	...	...	...	...	...	
Nelsonville, Ohio	...	...	...	...	1	...	...	...	...	...	...	
Newark, Ohio	...	...	...	...	3	...	4	...	1	...	...	1 hose reel, 8 hand chemicals
New Philadelphia, Ohio	...	...	2	...	1	...	...	...	2	...	...	
Norwalk, Ohio	...	...	1	...	...	...	...	...	2	...	1	Will have 1 auto soon, 50 gal. chemical tank on ladder truck
Norwood, Ohio	1	...	1	...	1	...	1	...	1	...	1	
Oberlin, Ohio	...	...	1	...	1	...	...	...	1	...	1	

a Hand drawn.
c Combination.

FIRE DEPARTMENT STATISTICS—(Continued)

APPARATUS IN SERVICE, NUMBER OF PIECES.

City.	PUMPING ENGINES.		HOSE WAGONS, PLAIN		HOSE WAGONS, COMB.		CHEMICAL ENGINES.		LADDER TRUCKS.		SUPPLY WAGONS	Other Apparatus.
	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	
Painesville, Ohio	1	...	1	...	...	...	2	...	1	...	...	
Piqua, Ohio	1	...	1	...	2	...	...	...	1	...	1	1 engine, 1 chemical in reserve
Portsmouth, Ohio	2	...	2	...	...	...	...	...	1	...	...	1 comb. auto pumping and hose wagon
St. Bernard, Ohio	...	...	...	...	2	...	...	...	...	...	...	3 hand reels, 1 hand drawn ladder truck
St. Marys, Ohio	1	...	...	...	...	...	...	...	1	...	...	Chemical can on wagon
Salem, Ohio	1	...	...	...	1	...	...	...	1a	...	...	2 hand hose reels
Shelby, Ohio	...	...	...	...	...	1	...	...	1a	...	...	3 hose reels
Steubenville, Ohio	...	...	1	...	1	...	1	...	1	...	...	2 pumping engines in reserve
Tiffin, Ohio	...	...	1	...	1	...	...	...	1	...	...	1 pumping engine in reserve
Toledo, Ohio	14	...	...	...	17	...	...	...	9	...	...	1 water tower, 1 chief's auto
Toronto, Ohio	2	...	...	...	...	...	...	...	1	...	...	2 hose carts, 8 chemicals, 1 H. & L., wagon, 1 cart
Uhrichsville, Ohio	...	...	...	...	1	...	...	...	...	...	...	
Urbana, Ohio	...	...	1	...	1	...	...	...	...	...	...	
Van Wert, Ohio	2	...	1	...	...	...	...	...	1	...	1	
Warren, Ohio	1	...	1	...	2	1	...	...	1	...	...	
Washington C. H., Ohio	...	...	1	...	1	...	...	...	1	...	...	
Wellston, Ohio	...	...	...	...	1	...	...	...	...	...	...	
Youngstown, Ohio	5	1	3	...	5	1	...	...	2	...	7	2 hand reels
Zanesville, Ohio	...	...	3	...	4	...	...	...	1	...	...	
Blackwell, Okla	...	...	...	...	1	...	...	...	...	...	...	1 hose cart
Chickasha, Okla	...	...	...	...	2	...	1	...	1	...	...	Chief's wagon
Durant, Okla	...	...	1	...	...	...	...	...	1c	...	...	Double chemical engine
Enid, Okla	2	...	...	...	2	1	...	...	2	...	...	1 hand hose reel
Guthrie, Okla	1	...	1	...	2	1	2	...	2	...	1	
Hugo, Okla	...	...	...	...	2	...	1	...	...	...	...	
McAlester, Okla	...	...	1	...	1	...	1	...	1	...	...	
Muskogee, Okla	3	...	2	...	1	2	1	...	2	...	1	Chief's auto with chemicals
Okmulgee, Okla	...	...	...	...	1	...	...	...	...	...	...	1 hand reel
Shawnee, Okla	...	...	2	...	...	...	...	...	1	...	...	1 combination hose wagon and chemical, 1 chief's buggy
Tulsa, Okla	...	1	1	...	2	...	1	...	1	...	...	Expect auto engine and steamer
Astoria, Ore	...	...	3	...	1	...	1	...	...	...	1	2 pumping engines in reserve, 1 ladder truck, 6 hose carts
Baker, Ore	...	...	...	...	1	...	...	...	1	1	...	5 hand hose carts
Eugene, Ore	...	...	...	...	1	...	...	...	1a	...	...	5 hand hose carts
Portland, Ore	17	...	4	...	...	2	3	...	5	...	2	
Salem, Ore	2	...	...	...	2	...	...	...	...	...	...	2 hand reels
Allentown, Pa.f	6	...	1	...	7	...	2	...	2	...	1	1 reserve steamer
Altoona, Pa	6	...	7	...	2	...	...	...	2	...	1	
Bangor, Pa	...	...	3	...	...	...	...	...	1	...	...	12 small extinguishers
Beaver Falls, Pa	1	...	2	...	1	...	...	...	1	...	...	3 hose reels
Chambersburg, Pa	2	...	3	...	1	...	1	...	1	...	...	
Coatesville, Pa	2	...	1	...	2	...	1	...	1	...	...	
Conshohocken, Pa	1	...	2	...	2	...	...	...	...	...	...	
Du Bois, Pa	2	...	1	...	...	...	...	...	1	...	...	6 hand carts
Easton, Pa	4	...	1	...	4	...	1	...	2	...	...	2 4-wheeled hose reels in reserve, 2 2-wheeled hose jumpers in reserve
Erie, Pa	9	...	8	...	1	...	1	...	2	...	...	1 extra hose wagon
Forest City, Pa	...	...	1	2	1	2	...	...	...	...	...	
Franklin, Pa	1	...	2	...	...	...	...	...	1	...	...	1 hose reel
Harrisburg, Pa	7	...	2	...	9	...	...	...	3	...	1	1 chief's carriage
Hazleton, Pa	3	...	2	...	...	1	1	...	2	...	...	
Jeannette, Pa	...	...	...	...	...	...	...	...	1	...	...	5 hose carts
Johnstown, Pa	8	...	3	...	5	...	...	...	2	...	2	1 chief's auto with chemicals, etc.
Latrobe, Pa	...	...	...	...	...	...	...	...	1	...	...	5 hand hose carts
Lebanon, Pa	4	1	3	...	2	...	1	...	1	...	...	
Lewistown, Pa	2	...	5a	...	1a	...	...	...	2	...	...	
Meadville, Pa	...	...	1	...	1	...	...	...	1	...	1	2 pumping engines not in use, 3 hand carts
Mt. Carmel, Pa	1	...	4a	...	...	...	2c	...	1	...	...	
Nanticoke, Pa	...	...	4a	...	1	...	1	...	2	...	...	
New Brighton, Pa	...	...	2	...	...	...	...	...	1	...	...	3 hose reels, 1 reel in reserve
New Castle, Pa	1	...	...	...	7	...	...	...	2	...	...	1 auto engine, 600-gal. pump, 1 chemical tank, 2 ladders
Oil City, Pa	1	...	2	1	...	...	...	...	1	...	...	2 reserve carts
Olyphant, Pa	...	...	1	...	1	...	...	...	...	...	...	2 jumpers
Philadelphia, Pa	55	...	...	...	55	...	5	...	16	...	14	2 water towers, 3 high pressure wagons, 1 fire-boat, 10 reserve engines, 3 police boats, 2 battery wagons. 5 reserve trucks with 5 pumps
Pittsburg, Pa	45	...	4	...	13	...	2	...	20	...	1	4 combination hose reels and chemicals, 8 fuel wagons, 1 water tower.
Pottsville, Pa	4	1	2	...	3	...	1	...	1	...	...	2 hand drawn hose trucks
Punxsutawney, Pa	...	...	1	...	...	...	...	...	2	...	...	4 hose reels, 1 hand ladder truck
Scranton, Pa	7	...	6	...	8	...	1	...	1	...	5	1 hose wagon, 1 hose reel, 1 auto for Superintendent.
Shenandoah, Pa	2	...	...	...	2	...	1	...	1	...	...	
South Sharon, Pa	1	...	...	...	1	...	...	...	1	...	...	
Steelton, Pa	1	...	2	...	2	...	...	...	2	...	...	1 hand reel, 1 hose reel
Stroudsburg, Pa	1	...	2	...	...	...	1	...	...	...	...	
Tamaqua, Pa	...	...	1a	...	2	...	1	...	1	...	...	
Tyrone, Pa	2	...	1	...	2	...	1	...	1	...	2	2 hand trucks
Uniontown, Pa	1	...	3	...	2	...	2	...	1	...	...	Patrol
Warren, Pa	1	...	2	...	1	...	...	...	1	...	1	
Washington, Pa	1	...	...	...	1	...	...	...	1	...	...	
West Chester, Pa	2	...	3	...	2	...	1	...	1	...	...	
Wilkes-Barre, Pa	6	...	1	...	...	1	1	...	3	...	1	
Williamsport, Pa	5	...	4	...	2	...	...	...	1	...	...	
York, Pa	6	...	1	...	5	...	1	...	1	...	7	1 turret wagon, equipped
Pawtucket, R. I	2	1	...	...	6	...	...	...	3	...	6	1 combination, 1 truck in reserve
Westerly, R. I	2	...	2	...	...	...	1	...	1	...	...	4 hose reels
Charleston, S. C	6	1	6	...	1	...	1	...	2	...	1	5 reserve engines
Greenwood, S. C	3	...	1	...	1	...	1	...	1	...	...	
Newberry, S. C	...	...	2	...	...	...	...	...	1	...	...	

a Hand drawn.—c Combination
f Part of this is supplied by Penn. R. R. Co.

FIRE DEPARTMENT STATISTICS—(Continued)

APPARATUS IN SERVICE, NUMBER OF PIECES.

City.	PUMPING ENGINES.		HOSE WAGONS, PLAIN		HOSE WAGONS, COMB.		CHEMICAL ENGINES.		LADDER TRUCKS.		SUPPLY WAGONS	Other Apparatus.
	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	
Orangeburg, S. C.	...	...	2	...	...	...	...	...	1	...	...	2 hand reels
Union, S. C.	...	...	2	...	...	...	...	...	...	...	...	
Aberdeen, S. D.	1	...	1	...	1	...	...	...	...	...	...	
Mitchell, S. D.	2	...	3	...	...	...	1	...	1	...	...	
Sioux Falls, S. D.	1	...	2	...	...	...	1	...	1	...	1	
Watertown, S. D.	2	...	1	...	1	...	...	...	1	...	...	
Chattanooga, Tenn.	7	...	...	...	5	...	1	...	1	...	1	2 hose reels, 1 chief's auto
Cleveland, Tenn.	...	...	1	...	1	...	...	...	...	...	...	
Dyersburg, Tenn.	3	...	...	...	1	...	...	...	...	...	...	
Jackson, Tenn.	...	...	1	1	...	...	1c	...	...	...	...	Extra hose wagon
Knoxville, Tenn.	5	...	1	...	4	...	1	...	1	...	1	1 water tower, 1 horse drawn reel, 1 reel and 1 wagon in reserve. 2 chief's buggies
Memphis, Tenn.	13	...	4	...	4	...	1	...	3	...	1	5 hose reels, 1 water tower, 4 engines, 1 H. & L. truck, 1 chemical engine, 2 hose reels in reserve.
Murfreesboro, Tenn.	...	...	...	...	1	...	...	...	1	...	...	
Nashville, Tenn.	9	...	6	...	6	...	1	...	2	...	1	2 autos for chief and asst. In reserve, 2 engines, 1 chemical engine, 1 truck, 2 reels, 3 chief's buggies
Austin, Texas.	...	...	8	...	...	...	...	...	1	...	...	Chief's buggy
Beaumont, Texas.	4	...	3	...	2	...	1	...	2	...	...	1 comb. motor wagon ordered
Brownsville, Texas.	...	...	...	...	1	...	...	...	...	...	...	2 hand hose reels
Brownwood, Tex.	...	...	1	...	1	...	...	...	...	...	...	
Corpus Christi, Tex.	...	...	...	...	...	...	...	...	...	...	...	
Dallas, Tex.	8	2	4	...	4	...	2	2	4	...	2	4 hand hose reels
Denton, Tex.	...	...	1	...	...	...	1	...	1	...	...	5 reels, 1 chief's auto
El Paso, Tex.	3	...	1	...	4	1	...	...	1	...	1	1 reserve hose wagon, 3 hand hose reels
Ennis, Tex.	1	...	1	...	...	...	...	...	...	...	...	Chief's auto
Fort Worth, Tex.	3	...	9	...	2	2	1	...	3	...	1	1 supply cart
Gainsville, Tex.	...	...	2	...	...	...	1c	...	1	...	...	
Galveston, Tex.	3	1	4	...	2	...	1	...	2	...	1	2 chief's buggies
Greenville, Tex.	1	...	1	...	2	...	...	...	1	...	...	Chief's buggy
Paris, Tex.	1	1	3	...	...	...	1	...	1	...	1	
San Angelo, Tex.	...	...	...	...	1	...	1	...	...	...	...	
San Antonio, Tex.	6	...	5	...	6	2	...	...	1	...	...	Chief's auto with chemical, 1 hose wagon in reserve
Sherman, Tex.	1	...	3	...	...	...	1c	...	...	...	1	1 chief's buggy, 1 chief's auto. Will buy new steamer
Tyler, Tex.	...	...	1	...	1	...	1	...	...	...	...	
Waco, Tex.	6	...	7	...	...	...	1	1	2	...	1	1 chief's buggy
Waxahachie, Tex.	1	...	2	...	...	...	...	...	1c	...	...	1 steamer in reserve
Ogden, Utah.	1	...	2	...	1	...	1	...	2	...	...	1 chief's auto, 1 35-gal. chemical, 1 hand pump, 1 hose reel
Provo City, Utah.	1	...	1	...	1	...	...	...	...	...	...	
Salt Lake City, Utah.	3	...	4	...	2	1	1	...	3	...	1	1 85-ft. aerial, 2 chief's buggies, 1 chief's auto
Bellows Falls, Vt.	1	...	...	...	1	...	...	...	1	...	...	6 hose carts
St. Albans, Vt.	...	...	2	...	...	...	...	...	1	...	...	1 chief's wagon
St. Johnsbury, Vt.	...	...	5	...	...	...	...	...	1	...	1	40 hand extinguishers
Alexandria, Va.	2	...	2	...	...	...	...	...	1	...	...	
Charlottesville, Va.	1	...	1	...	...	...	...	...	1	...	1	
Clifton Forge, Va.	...	...	1	...	1	...	...	...	1	...	...	3 hand reels
Harrisonburg, Va.	...	...	...	...	...	...	...	...	1	...	...	6 hand reels
Lynchburg, Va.	3	...	2	...	3	...	...	...	1	...	2	1 wagon
Norfolk, Va.	8	...	...	...	6	...	1	...	4	...	2	3 chief's wagons, 2 hose carriages. Ordered 1 auto pumping engine, 1 combination hose wagon
Petersburg, Va.	...	...	1	...	3	...	...	...	1	...	...	
Portsmouth, Va.	3	...	...	...	5	...	...	...	1	...	...	
Richmond, Va.	12	2	3	...	10	1c	...	...	5	...	6	
Roanoke, Va.	3	...	...	...	3	3	...	...	1	...	1	1 chief's wagon
Staunton, Va.	...	...	1	...	1	...	...	...	...	...	...	
Winchester, Va.	3	1	2	1	...	...	...	...	1	...	...	
Aberdeen, Wash.	1	...	...	...	2	...	...	...	1	...	1	6 hand hose reels, 1 hand chemical cart
Everett, Wash.	1	...	3	...	...	...	...	...	1c	...	...	
Bellingham, Wash.	...	...	1	...	2	...	...	...	...	...	...	Chief's auto with chem. hose and tank
Hoquiam, Wash.	1	...	...	...	3	...	...	...	1a	...	...	
North Yakima, Wash.	1	1c	...	1	1	...	...	1	...	...	...	
Olympia, Wash.	...	...	1	...	1	1	...	...	1a	...	...	
Spokane, Wash.	7	...	2	2	6	1	1	1	3	1	1	2 20-gal. chemicals on wheels
Tacoma, Wash.	8	...	9	...	1	...	1	...	2	...	1	2 autos for chiefs
Vancouver Wash.	2	...	1	...	1	...	...	...	...	...	1	2 hose reels, 1 auto hose wagon combination ordered
Walla Walla, Wash.	1	...	1	...	1	1	...	...	...	...	...	1 engine, 1 chemical and 1 ladder truck in reserve
Charleston, W. Va.	2	...	2	...	2	...	1	...	1	...	1	
Elkins, W. Va.	...	...	1	...	...	...	...	...	1	...	...	3 plain carts
Morgantown, W. Va.	...	...	1	...	...	...	...	...	1	...	...	
Wellsburg, W. Va.	...	...	...	...	1	...	...	...	2	...	...	12 chemicals, 3 hand reels
Wheeling, W. Va.	4	...	...	...	7	...	1	...	2	...	5	1 chief's auto, 1 ass't. chief's buggy
Appleton, Wis.	1	...	3	...	...	...	...	...	1c	...	1	1 chief's wagon
Ashland, Wis.	...	...	3	...	...	...	1	...	1	...	...	Chief's buggy
Baraboo, Wis.	...	...	...	...	2	...	...	...	2	...	...	1 hand reel
Beaver Dam, Wis.	...	...	...	...	1	...	...	...	1	...	...	1 hose reel
Chippewa Falls, Wis.	5	...	1	...	1	...	1	...	...	...	1	1 hand cart and 2 hand chemicals
Eau Claire, Wis.	...	...	3	...	1	...	...	...	1	...	...	1 pumping engine in reserve
Grand Rapids, Wis.	1	...	2	...	...	...	...	...	1	...	...	
Janesville, Wis.	2	...	2	...	2	...	1	...	1	...	1	Auto for chief
Kenosha, Wis.	...	...	...	...	3	...	...	...	1	...	...	

a Hand drawn.
c Combination.

FIRE DEPARTMENT STATISTICS—(Continued)

Apparatus in Service, Number of Pieces.

City.	Pumping Engines.		Hose Wagons, Plain		Hose Wagons, Comb.		Chemical Engines.		Ladder Trucks.		Supply Wagons	Other Apparatus.
	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	Auto.	Horse.	
La Crosse, Wis.	3	...	4	...	1	...	...	...	3	...	5	1 truck and 1 hose wagon
Madison, Wis.	2	...	2	...	2	...	1	...	2	...	1	1 buggy, 1 wagon for electrician
Manitowoc, Wis.	2	...	2	...	...	...	1	...	1	...	1	Chief's buggy
Marshfield, Wis.	...	...	1	...	...	...	...	...	1	...	...	4 3-gal. fire extinguishers
Menomonie, Wis.	...	...	...	...	1	...	1	...	1	...	2	
Merrill, Wis.	...	...	2	...	...	...	...	...	1	...	...	
Milwaukee, Wis.	25	...	20	...	9	...	6	...	13	...	4	4 fire-boats, 1 water tower. In reserve, 4 engines, 2 trucks, 5 hose wagons, plain, 2 double tank chemical engines, 1 single tank chemical engine
Neenah, Wis.	1	...	2	...	...	...	...	...	1	...	...	
Plymouth, Wis.	1a	...	3a	...	...	...	1a	...	1a	...	...	
Portage, Wis.	1	...	1	...	...	...	...	...	1	...	...	3 hose carts, 1 80-ft. ladder
Racine, Wis.	2	...	1	...	4	1	...	...	2	...	6	1 chief's auto
Rhinelander, Wis.	...	...	1	...	1	...	...	...	1	...	2	
Ripon, Wis.	...	...	1	...	...	...	1	...	1	...	1	4 hand chemicals
Sturgeon Bay, Wis.	3	...	3	...	...	...	1	...	1	...	1	
Superior, Wis.	3	...	1	...	4	1	...	...	2	...	6	Fuel wagon, 3 deluge sets
Waukesha, Wis.	1	...	1	...	...	...	...	...	1	...	1	
Warsaw, Wis.	2	...	...	...	4	...	...	...	1	...	...	
Sheridan, Wyo.	...	...	...	...	1	...	...	...	1a	...	1	

a Hand drawn.

104 departments have drill schools, while 57 others have regular drills at periods varying from three times a week to four times a year.

Alarms and Wires.

The table shows 477 cities as making all fire alarms public; 55 as having still alarms only, and 105 as having both.

Of 641 cities reporting, 114 state that the wires in their business districts are under ground; 50, that they are partly so; 4, that they are now being buried; and 12, that this is proposed.

Automobile Apparatus

The second table shows that the adoption of automobile apparatus has progressed wonderfully during the past three or four years; and on the other hand that there are still in use a considerable number of hand-drawn pieces of apparatus, principally in the smaller cities. The cities reporting name 58 auto pumping engines, 15 plain hose wagons, 217 combination wagons, 24 chemical engines, 8 ladder trucks and 92 chiefs' autos. This makes a total of 414 pieces of auto apparatus. If the 20 per cent of cities not reporting averaged one-half as well supplied, this would mean about 455 pieces of auto apparatus in use in the country. The number is probably not less than 425 nor greater than 500. When compared with the total amount of apparatus of all kinds reported—more than 8,000—this is not a very large number, but it must be borne in mind that many cities feel that they can afford to acquire auto apparatus only to replace horse-drawn as it wears out; and that many others are waiting to study the experiences of those which are making the change. We may expect to see increasing purchases of auto apparatus each year for some time. Among the cities reporting their intention of purchasing auto apparatus are Bridgeport and West Haven, Conn.; Rochester, Minn.; Lincoln, Neb.; Morristown, N. J.; Ithaca, N. Y.; Ashtabula, Bellaire, Elyria and Norwalk, O.; Tulsa, Okla.; Beaumont and Sherman, Tex.; Norfolk, Va.; and Vancouver, Wash.

Other Apparatus.

The total number of pieces of apparatus, other than automobile, reported by the 692 cities and towns is as follows: Horse-drawn, 1,831 engines, 1,789 plain hose wagons, 1,128 combination hose wagons, 386 chemical engines, 1,083 ladder trucks, 675 supply wagons; 805 pieces of apparatus in reserve or of kinds not specified in the table; a total of 7,697. Hand-drawn apparatus, in service, 2 engines, 48 plain hose wagons, 15 chemical engines, 19 ladder trucks, 4 supply wagons; in reserve and of kinds not specified, 311; a total of 399. Horse, automobile and hand, this gives a total of 8,510.

DECORATING DENVER FIRE HOUSES

Of the seventeen engine houses connected with the Denver Fire Department, ten have been made to look very attractive by extra attention paid to the care of the lawns and also to the growing of flowers and shrubbery on the grounds surrounding the houses. This is possible in these cases because the houses are located in resident districts and surrounded by small tracts of ground. The firemen since spring have been utilizing their spare time in making these premises as attractive as possible. The heads of the department are giving the men every encouragement in this and it is probable that next year a prize will be offered by the city to the fire company making the best showing in the line of perfectly kept lawns and attractive gardens.

The plants used by the firemen for these decorations were supplied this year free of charge by the city park conservatories; and next year it is proposed to provide at these conservatories an additional number of flowers and shrubs for this purpose.

FIRST AID INSTRUCTION FOR FIREMEN

Emergency hospitals for giving first aid to the injured are being established in all of the 58 fire engine houses in Pittsburg, Pa., a room in each of the houses being set aside for this purpose, in which injured firemen can receive prompt attention previous to the arrival of a physician or removal to a hospital. In connection with this idea the firemen are receiving a course of instruction in rendering first aid; this including the administration of medicines and stimulants for men who have been overcome and of oxygen for firemen who have inhaled smoke, and thorough instruction in the use of antiseptics and the application of bandages. The police of the city have already been instructed in first aid work, and there are several members of that force who can now dress and sew up a wound as well as the average physician.

AUTO FIRE APPARATUS AT LONDON

Little has yet been done toward the introduction of auto fire apparatus into the London fire brigade, but the change has been begun and it is prophesied that the next few years will see the complete change of the present equipment to mechanical traction It is estimated that over 200 appliances will be needed, costing over $1,000,000. The finance committee which has been investigating the matter has been informed that gasoline fire engines will last at least seven years and other motor apparatus from ten to fifteen years.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

To Adopt Convict System of Road Making

Dalton, Ga.—At a meeting of the Whitfield County Board of Roads and Revenue Commissioners held recently it was decided to adopt the convict system of working the public roads of the county. In making the decision the Board was guided by the petitions sent broadcast over the county to sign for or against the system. These petitions were signed by 1,391 voters, 886 being in favor of convicts and 505 opposing them. The Board having already promised that the majority should rule, nothing else could be done but adopt the method. The State Prison Commission will be asked at its meeting next February to give Whitfield her quota of the State's felony convicts, which is said to be about 12 to 15. In addition to this all of the county's misdemeanor convicts will be put on the roads, which means that the county will have next year between 20 and 30 convicts improving her highways. The road tax was increased 1.7 mills, making a total of 3.7 mills for the work of building and improving roads. This will bring into the county treasury a fund of nearly $17,000 a year for this purpose, which is said to be a sufficient amount to pay all expenses of the convict camp and buy the very best road-working machinery.

New Canyon Road

Albuquerque, N. M.—A new macadamized highway is being constructed along the Grand Canyon of Arizona for 6½ miles from what is known as Sunset Point to a connection with the El Tovar Hotel, and other points of interest along the rim. The road is being built at a cost of $30,000, and, it is said, when completed will stand as the most wonderful scenic highway in the world. At present one can travel along the rim of the canyon going west for but 2½ miles. With the additional six miles of new road the drive will be a little less than 10 miles. At the west end of the highway a magnificent stone structure will be erected as a "rest house," where a large collection of curios, paintings and photographs of the canyon will be available.

Lay Dry Concrete to Avoid Lawsuits

Superior, Wis.—At a meeting of the Board of Public Works instructions were issued to the contractor and subcontractor on the Belknap street paving job to hereafter use a dry concrete mixture for the base. The mixture is to be tamped until free water flows on the surface, as the specifications provide. The Board of Public Works took the action, it is given out, not because of any doubt as to the quality of the work thus far done on the street, but to stop all criticism and prevent any possibility of lawsuits. Threats of suit against the city have been made by lawyers who represent some of the property owners on the street. The City Attorney thinks that it could be proven that the specifications are lived up to. The Board of Public Works, however, prefers that the work be so done that there be no shadow of doubt in the matter. The action of the Board will bring to an end a controversy that has raged ever since the work of laying the concrete base on Belknap street was commenced. The controversy was started by lawyers for the property owners sending a communication to City Engineer E. B. Banks in which it was contended that specifications were not being followed, inasmuch as a wet mixture was being used instead of a dry mixture tamped.

Sidewalks for All Streets

Pontiac, Mich.—An ordinance has been adopted providing for sidewalks on almost every street of the city which has not a walk and the ordinance providing that the city pay 4⅛ cents of the cost of walks, amended to make the city pay 4½ cents. This is on the basis of walks costing 9 cents per foot. The City Attorney was directed to begin condemnation proceedings against the Grand Trunk Railway Company to secure the opening of Sanford and Jessie streets across the air line tracks.

Favor Plan of Dumping Earth from Bridge

New York, N. Y.—Borough President Gresser has received a communication from Bridge Commissioner Arthur J. O'Keefe, stating that he will atttend the conference at the President's office, at which time there will be considered the proposition of placing chutes on the Queensboro Bridge, whereby material can be dropped from the floor of the bridge to the land beneath, owned by the city, for the purpose of filling it in. This is a proposition by which President Gresser hopes to get the streets under the bridge filled in at a nominal cost, and which will save the city of New York and the taxpayers close to half a million dollars. Commissioner O'Keefe states in his communication to President Gresser that he has his engineers now working on the proposition, and that at the conference he will be prepared to state definitely as to the feasibility and practicability of the scheme. Henry C. Johnson, Jr., chairman of the committee of the Long Island City Business Men's Association, which is working with President Gresser in this matter, has received a letter from Kingsley L. Martin, former Bridge Commissioner, in which he states that when he had this matter under advisement the scheme was practicable.

Grade Crossing Elimination Half Done

Chicago, Ill.—Track elevation in Chicago has cost the railroads $66,256,000, and yet less than half of the 367 miles of roadbed in the city is elevated, according to the annual report of Francis J. Owens, city superintendent of track elevation. The report covers the work of the department up to June 30, and is supplemental to the history of the department which was issued when Walter J. Raymer was superintendent of the department. Twenty different roads have carried through the work already completed and four more are affected by ordinances which have been passed, though the work has not started. Suggestion is made in the report that the steel work of subways be painted white, so as to make them lighter, and that the artistic appearance of the subways would be improved if they are built of reinforced concrete rather than of steel.

Underground Work Caused Delay

Saginaw, Mich.—It is the opinion of City Engineer Roberts that the street paving improvements of 1911 will be completed by November 1. There are being laid this year in all about 3 1-3 miles of pavement, representing 42,000 yards of asphalt, 7,000 yards of brick and 3,500 yards of bituminous macadam. The delay in completing the work is partly due to a delay in starting it, which was caused by a large amount of sub-work, as in the case of Janes and Park streets, where the laying of the water main has rendered paving operations impossible up to the present.

Galveston's Sea Wall Boulevard Finished

Galveston, Tex.—Galveston's great sea wall boulevard that extends along the Gulf of Mexico for over four miles, which has been under construction for four years, was finished September 5. The last bricks were placed in the 50-foot driveway and the 16-foot concrete sidewalk that adjoins the brick roadway on one side and the sea wall on the other was completed, and the whole boulevard has been opened to the public.

River Banks to Be Paved to Top

Augusta, Ga.—The stone paving work now being done on the banks of the river will be built up to the crest of the bank instead of only a part of the distance to the top as was at first contemplated. Plans for this change have been approved by the Chief of Engineers of the War Department, and the only thing remaining to make the change effective is the acceptance of the supplemental contract by the present contractors at the same price as that under which the present improvement is being done. The revised plans as approved provide for the increased higher level for the paving to extend from Hawk's Gully to the warehouse near the North Augusta bridge.

SEWERAGE AND SANITATION

Sewer Construction Permitted if Disposal Plant Is Built.

Portage, Pa.—At a special meeting of Borough Council recently the decree of the State Health Department, permitting borough authorities to construct approximately one mile of sewer on Caldwell avenue, Main stret, and Mountain avenue, was read and accepted by that body. It had been just three weeks since Consulting Engineer O. P. Thomas, of Johnstown, filed with the State Health Department the preliminary plans for a comprehensive sewer system for the borough, with the application for permission to install the sewers just mentioned. This is considered record time for securing a permit of this kind. The decree of the State Health Department carries with it a provision that complete plans and profiles, to cover the entire borough, together with plans for intercepting and outfall sewers to the site of a filtration plant itself, be filed with the department by January 1, 1912.

Reading Buys Sewage Plant.

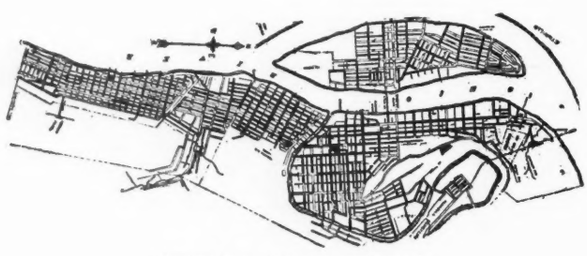
Reading, Pa.—The city of Reading has taken over from Oliver M. Weand the sewage disposal plant which Mr. Weand operated and maintained for five years. With the transfer there came to the city two units to the disposal plant, which Mr. Weand constructed. He was paid for the operation of the system and the construction of the two filter units $195,499.80. In addition, he will receive six months hence, provided the system works satisfactorily, the retained percentage, which amounts to $35,300.

May Use Sewers if Annexed

Paterson, N. J.—Mayor McBride and Mayor Walter R. Hudson, of Totowa Borough, together with J. Willard De Yoe, counsel for Totowa, Haledon and Prospect Park boroughs, have discussed the question of having Totowa Borough connect with the West Paterson-Totowa sewer and the other two boroughs, also connecting with the Paterson sewer system. Mayor McBride informed them that Paterson would not permit other municipalities to connect with Paterson's sewer system unless they were annexed to the city. The borough officials were not ready to discuss this proposition, but asked for another conference on the matter.

Wheeling's Need of Sewerage Discussed

Wheeling, W. Va.—According to a published statement of R. B. Naylor, secretary of the Board of Trade, Wheeling has an antiquated and utterly inadequate system of sewage, consisting of waste from baths, water closets, sinks and sewage from many industries. The accompanying map shows the location of every sewer in the city, and a study of it reveals many a section without any sewers whatsoever. A government expert recently estimated that about 28,000 people in Wheeling were using sewers. The other 14,000 of population have no sewer connections. The importance of removal and disposal of filth should need no explanation,



SEWERAGE MAP OF WHEELING

Mr. Naylor continues. Inadequate sewage is one of the essential things which should be had by every city. It is as much of a necessity as police and fire protection. In addition to the inadequacy of the sewers the disposition of the sewage itself is open to the gravest criticism. The sewage is conducted to creeks and the Ohio River for final disposition. These streams are used by people below for the source of the public drinking supply. The question of adequate sewage, a proper method of sewage disposal, and a pure water supply are the three greatest problems confronting the municipality at the present time, and their importance demands immediate attention.

WATER SUPPLY

Air Pressure Water Tank Explodes

Jessup, Iowa.—With the exploding of the water tank a disaster occurred here which is of great interest not only to the immediate vicinity but to hundreds of small towns using air pressure water systems in this State, as well as surrounding States. Rolla E. Newcomb took views of the power building as it now is totally ruined. These negatives were taken immediately and were chemically dried. The water tank exploded only a short time after Engineer Bagenstos left the building, so that no one was injured, which

Courtesy Waterloo (Ia.) Courier.

WATER TANK EXPLODED BY AIR PRESSURE

was the one fortunate thing about the incident. The loss to the community is great, amounting to the cost of the building, pump, engine and tank, as well as the lack of protection against fire. Many families are also deprived of water. The system has hitherto been very efficient, having saved the town several destructive fires, and the disaster comes as a total surprise to everyone. It appears as though a safety valve should have been provided on the tank. When the tank broke the force of the escaping air raised it almost on end, threw it against the side of the building with such force as to crush it entirely and sent bricks to a distance of 100 feet in the air.

Petition for Appointment of Water and Light Commission

Virginia, Minn.—A petition containing the names of 35 per cent of the registered voters of the city at the last election has been presented to the City Council through the City Clerk, requesting the passage of an ordinance providing for the appointment of a special water and light commission of five members, empowered to thoroughly investigate the water and light problem and take such steps as may be necessary to bring about municipal ownership of the water and light plant. The ordinance provides further that the commissioners shall serve for two years and for an appropriation of $2,500 to meet the necessary expenses in connection with an investigation as well as other important provisions. Under the terms of the city charter, in case the City Council does not care to pass the measure without change, it must be submitted to the voters at a special election to be called within 30 days after the City Clerk certifies the petition to the Council as having the requisite number of legal signatures as provided for under the city charter. Under the city charter initiative legislation must be submitted to the voters at a special election in case at least 15 per cent of the registered voters of the last election sign the necessary petition and in case 7 per cent of the registered voters sign the petition it must be submitted at the next regular election, the alternative being in each case the passage of the initiative legislation unchanged by the Council.

Water Test Shows Good Fire Protection

Huron, S. D.—Consulting Engineer Wolff, of St. Paul, who superintended the water test made recently, is well satisfied with the new system for water supply now being completed. The test gave a pressure of 92 pounds at the hydrants furthest from the pumping station.

FIRE AND POLICE

New Device Is Protection for Firemen

Manchester, England.—The city of Manchester has adopted a new equipment for the use of its fire brigade when fighting fires in cellars or heavy smoke. The steam fire engine used for this service has an air pump mounted on the same truck with it and connected to six reels of flexible metallic hose mounted under the truck. Interwoven with this hose is a pair of wires leading to a small telephone switchboard. Each hose is easily coupled to the back of a masked smoke helmet which a fireman can slip over his head and which distributes the air around his face so as to keep the eyes and nose clear of smoke. Each helmet is also fitted with a telephone receiver and transmitter, so that the wearer can readily talk to the officer standing beside the engine, reporting to him as to the conditions inside the building and getting his orders instantly. Hooked to his belt each fireman also carries a 32-candlepower incandescent lamp, from which a cable leads to a dynamo belted to the fire engine.

New Engine House Has Gasolene Storage Tanks

San Antonio, Tex.—Two fireproof storage tanks for gasolene are to be installed for the motor apparatus in fire stations Nos. 1 and 7, Frio and Matamoros and Lavaca and Water streets. The tanks are also intended for a reserve supply to be fed speedily to any of the three pieces of motor driven apparatus in the department, being fitted with automatic self-measuring pumps, and with a capacity of 120 gallons (two barrels) each. This system is used in public garages. The tanks will be installed by R. E. Chrone, local agent of the S. F. Bowser factories, of Ft. Wayne, Ind., to whom the contract was awarded. Secretary C. L. Grasp, of the department, is working on a card index system for each fire station, giving the location of boxes and signal stations, and arranged for a record of the alarms responded to by each company and the "covering in" by companies in their respective districts on first, second and third alarms. The preparation of this system will involve several weeks of arranging and indexing.

Auto Patrol a Money Saver

Wilmington, Del.—That the automobile police patrol is a good investment was made known at the weekly meeting of the Police Commission last week, when it was reported that with only 20 days' actual service the apparatus had traveled 320 miles, made 258 calls and carried 369 prisoners. The upkeep of the machine will average about $40 a month, including tires and all other necessities. The horse drawn vehicles cost the city about $125 a month. In addition to the regular drivers of the machine, the patrol sergeants are now being taught how to operate the car.

Want Automobile for Fire Chief

Portland, Me.—Because of the great convenience of autos in the other city departments the advisability of purchasing an auto for Chief Flaherty will be considered at the next meeting. The chief is of the opinion that an auto could be used to advantage, as in many instances he is obliged to go a long distance to a fire and a horse soon tires. Chief Flaherty said that if an auto should be secured he believed that there should be room for pony chemicals, as very often the chief's conveyance would be the first on the scene, and with a small fire in progress the chemical tanks carried would be sufficient to extinguish the fire. An automobile for the use of the chief may be found in many smaller cities than Portland. The advantage of speed in making house calls gives more time for the chief at headquarters.

Queens Has a Fire Train

Long Island City, N. Y.—To give better fire protection to villages in Queens, Fire Chief Kenlon has announced that an arrangement had been made with the Long Island Railroad by which trained fire fighters with apparatus may be shipped at a few minutes' notice from Long Island City to almost any point on the railroad within the limits of the borough. A flat car with a runway has been provided and is kept in readiness on a switch in the freight yard at Eighth street, Long Island City. This car can take aboard an engine, tender and hose cart and carry the crews. Horses will not be taken aboard, but by sending messages ahead teams will be ready at the car's destination.

Figuring on Saving by Motor Apparatus

Ft. Wayne, Ind.—"As an economical measure Ft. Wayne should begin immediately the work of superseding all horse drawn trucks in the Fire Department with motor propelled wagons," City Comptroller W. Sherman Cutshall said in discussing the feasibility of adding a motor chemical engine to the department complement. "Horse drawn outfits are too expensive of operation to be considered any longer, in view of the advance made in motor fire truck building. It would cost Ft. Wayne $100,000 to accomplish this result, and it obviously could not be done in a day or a year, but certainly it should be started, with a view to completing it at as early a date as possible. Every day that this city employs horses to draw its fire apparatus it is wasting money. With hay $20 a ton and going higher, corn 70 cents a bushel, and other stable necessities equally as expensive, keeping 30 or 40 head of vigorous, big horses is a very costly thing. Why, there was one stretch of six months when No. 2 engine house never turned a wheel, but the feed bills ran along at the same old clip. If the house had been equipped with motor trucks the maintenance expense would have been nil when the wagons were not working. I believe that a better solution for the Tenth Ward's lack of fire protection than building an engine house is to install motor drawn vehicles in No. 2 engine house. The auto trucks could cover twice as much territory in half the time, thus affording the Tenth Ward ample fire protection and still keeping the apparatus where it could be used for big downtown fires. The insurance rates would naturally be materially lowered by such an installation," Mr. Cutshall concluded.

New Auto Fire Engine to Be Tested

Saginaw, Mich.—Saginaw's new auto fire engine has arrived at Hose House No. 3, where it is the center of admiration of crowds of visitors. Beyond setting it up and making it ready nothing will be done until after official tests have been made, though it is not improbable that unofficial tests will take place in the mean time. It is claimed that the machine will throw a stream high enough to go over the top of the First Baptist Church steeple on South Jefferson avenue.

Skilled Mechanics for Fire Department Service

Yonkers, N. Y.—So far as the legality of the proposed action is concerned the Commissioner of Public Safety may fill the several vacancies in the Fire Department with men who are skilled mechanics. A statement to this effect was given out in the office of the Corporation Counsel. Commissioner Fleming came to the conclusion that the appointment of mechanics on the force would mean the saving of a considerable sum in money because they could do all the necessary work on the automobile fire engines and pump, obviating the present necessity of sending mechanics from a garage. Also their services might be utilized in doing repair work on the other pieces of apparatus. The idea was that not only should these men be employed as mechanics but that they should also respond to alarms. The only question in the Commissioner's mind was as to whether it was legal to so limit the Civil Service examination that only those who could pass the test of mechanic would be eligible to enter the competition. The Commissioner is understood to have referred the question to the Corporation Counsel's office. It was said there that the Commissioner had a perfect moral and legal right to ask the Municipal Civil Service Commission to fix such limitations as were reasonable, and in this category could be placed the limitation of being a skilled mechanic. It is expected that as soon as this opinion is formally received by the Commissioner he will ask the Municipal Commission to hold an examination for the filling of the five vacancies in the department. If this should be done, and there appears no doubt at this time that it will surely be done, it will be a new departure in the appointment of men to the Fire Department.

City Officials to See Auto Engine Test

Cleveland, Ohio.—City officials will witness a demonstration in East Cleveland of the workings of a motor driven fire engine the village plans to purchase. As there will be a motor driven engine in the new Ashbury avenue fire station Public Safety Director Hogen is interested in the test. The West Side fire station now being erected will be equipped with the old type of engines.

All Reservoir Basins to Be Cleaned

Springfield, Mass.—Superintendent of the Water Department Charles A. Bogardus, following his policy of years past, will soon start cleaning the basins of all the local reservoirs. Not only are the reservoirs themselves to receive a thorough overhauling but even the brooks which furnish the water supply will be followed for a long distance back from the basins and cleared of all obstructions and accumulations. The work will be started at the Cooley brook reservoir, and a large number of men will be needed to do the work. The basins first will be drawn off by removing the flash boards. The men will then clean the gravel bottom of the basin with rakes. A small ditch will be dug in the surface of the basin near one side. The men will then begin at the edge of the basin and clean toward the small ditch, which will be connected with the supply brook in order that all of the sediment scraped from the bottom of the basin may be floated out through the waste channel. As soon as one side of the basin is cleaned in this fashion another small ditch will be dug on the opposite side and the operation will be repeated. In speaking of the work Mr. Bogardus said that it is the policy of the department to clean out the reservoirs once in every two or three years. The sediment removed from the basins, he said, is the result of the inflow of the water from the brooks, for no matter how clean the water from any of the brooks may be there is a certain amount of sediment carried with the water. This sediment gathers on the bottom of the basins little by little until the gravel bottom is covered with a coating of green deposit. This deposit does not in any way affect the water, but it is thought best to keep the bottom of the basins as free from the deposit as possible. As soon as the Cooley brook reservoir is cleaned the workmen will transfer their attention to the Abbey reservoir, and afterward to the small Willimansett reservoir. It will be necessary to stop the pumps while the cleaning process is going on, so that while the Cooley brook reservoir is being cleaned all water pumped into the storage standpipe will be pumped from the Abbey reservoir.

To Take Over Water Plant

Terre Haute, Ind.—The City Council has passed a resolution serving notice on the Terre Haute Water Company that the city would take over the water works system of Terre Haute under the provisions of a franchise granted in 1871, by which the privilege is given the city at the end of 50 years. By the terms of the franchise the city has the right to take control of the plant and pay 10 per cent a year on the capital stock, diverting the additional revenue, which is not needed for maintenance, to the city treasury. There is now some question as to the amount of capital stock on which the city will be compelled to pay 10 per cent dividends if the plant is taken over by it. The company was incorporated with $50,000 stock. This amount was raised to $1,000,000, but only $500,000 stock has been issued. Members of the Council say their action will result in a readjustment of water rates whether or not they succeed in establishing their contention that the city is bound to pay interest on only $50,000 capital stock.

Sixty per Cent of Water Unaccounted For

Bemidji, Minn.—According to figures presented to the City Council, this small ocean of 15,000,000 gallons of water has mysteriously disappeared from the Bemidji water works system, and it was decided that a committee composed of the City Engineer, City Water Clerk and the chairman of the Water Committee attempt to find it. City Clerk George Stein has figures showing that in April the meters at the pumping station registered for April 8,505,000 gallons; May, 9,855,700; June, 10,937,800, a total for these three months of 29,299,300 gallons. It is known that the meter measures at the station overran the actual amount pumped about one-sixth, and allowing 5,000,000 for this discrepancy, then adding the amount registered in consumers' meters, there still remain 14,000,000 gallons to be accounted for. It was the general opinion that there is a serious leak.

City Water Plant Pays

Monroe, Wis.—That the city water works plant was a financial success last year is evident by the report of Supt. M. T. Gettings, which shows that the plant made a net revenue of $1,428 for the year ending June 30. The total revenue was $17,260, 86,000,000 gallons of water were pumped and 860 tons of coal burned.

Claim Water Supply Is Being Curtailed

Newburg, N. Y.—The Water Commissioners of this city have instructed their counsel to inform the Water Supply Board of New York City that a change of conditions must take place in regard to the way in which the Pittsburgh Construction Company, contractor, is preventing the full supply of water on the Newburg city watershed reaching its reservoir. The contractors have taken advantage of recent heavy rains, formed a small reservoir for their own use and are permitting the city of Newburg to receive only such supply as comes by way of a flume. If the city of New York does not interfere the matter will be carried to the State authorities. The discovery was made in seeking a cause for the small amount of water that reached Washington Lake as a result of the heavy rains of a week. The water is of great value to the contractors for testing their large mains for the New York water supply laid through the Hudson Valley in this vicinity.

STREET LIGHTING AND POWER

Power for Rock Crusher

Chehalis, Wash.—The Washington-Oregon Corporation has closed a contract with the State of Washington to supply electric power to run the convict rock crushing plant located 12 miles west of here at Meskill. Construction of the pole line and installation of the power service will begin immediately.

Municipal Lighting Not Now Feasible Plan

North Adams, Mass.—The special committee of the City Council appointed to investigate the subject of a municipal gas and electric plant has reported unanimously "that it is not an opportune time now to attempt to secure control of the North Adams Gaslight Company," principally because under existing law the 2½ per cent of the city valuation that could be raised to pay for the plant would not be nearly enough, and because electrical development in the valley of the Deerfield, now going on, may give the city greater opportunities in the near future. The committee sticks by municipal ownership in the abstract and says that its recommendation now "is solely one of expediency."

Stafford Now Owns Lighting Plant

Stafford, Kan.—The formal transfer of the Larabee light plant to the city has been made and the plant is now running as a municipal one. The city authorities purchased the light and power plant from the Larabees on June 14 for $14,000, and this was paid at the time, but owing to delays in the finishing of the extensions of the plant the formal transfer of property was not made until last week.

Gas Wells Meet Expenses of Town and Leave Surplus

Harrisville, W. Va.—Harrisville, the county seat of Ritchie County, W. Va., pays the expenses of running the corporation without taxing the inhabitants. Some years ago the town authorities purchased several gas wells for lighting the town, and these have been operated so successfully that all town expenses can be paid, with a surplus piling up in the town treasury. The price of gas to the people will not go over 15 cents per 1000 feet in the next 15 years.

Commissioners Move for Cheaper Gas and Electricity

Trenton, N. J.—Cheaper rates and better qualities of gas and electricity were made the subject of a new crusade undertaken by the City Commission. Application will be made to the Public Utilities Commission for an investigation of conditions here, along with the inquiry the State Department has inaugurated in Passaic, with the idea of reducing the price of gas to 75 cents per 1000 feet and of providing a commensurate reduction in the cost of electric current. Mayor Donnelly explained that arrangements were already under way for a reclassification of cities in the State with reference to their consumption of gas and electricity and that unless early and insistent interference was offered Trenton might find itself in a class with Burlington and Bordentown rather than in company with Paterson and Passaic. As a result of Mayor Donnelly's statement City Counsel Charles E. Bird was instructed to take up the crusade with the Public Utilities Commission at once. He said that gas might be forced through the meters in such a way as to afford the same amount of profit at 50 cents per 1000 feet, through introducing more air, as is obtained at the present rate of $1 per 1000 feet.

GOVERNMENT AND FINANCE

To Keep City Finances Account in One Department

Trenton, N. J.—The City Commission went thoroughly into the question of systematizing municipal business at the last meeting, giving a hearing to Eugene Shinn, of Brooklyn, who lately introduced modern methods in the management of local governments in Jersey City and Hoboken. A simple plan of keeping track of all finances in one single department, under a single bookkeeping head, was suggested, and the introduction of separate accounts under 100 to 400 subdivisions. It was explained that beneficial results could be obtained in 10 days in readjusting old methods to meet new conditions, and that no unwieldy complications need be encountered in introducing the change. According to Mr. Shinn the entire financial situation of the city could be shown on two pages in the treasurer's office, and that monthly or daily balance sheets might be readily stricken off. He explained that consolidations and simplifications in the control of different ordinary municipal departments would materially reduce the cost of carrying on city business—the same as is done in the management of up-to-date corporations. In the opinion of the expert the introduction of the latest municipal methods, in line with the recommendations of the national government and the League of American Municipalities, would afford an extraordinary appreciable saving in the cost of clerical hire, and it was seen from his suggestions that the Commission might soon be enabled to lop off a goodly share of dead wood and wipe out numerous sinecures that have long been maintained under the old form of government.

Commission Government Illegally Elected

Guthrie, Okla.—The Supreme Court of Oklahoma has decided that the municipal election by which Guthrie adopted the commission form of government several months ago was improperly called and that the city is still under the control of the old Aldermanic Board. The decision reverses that of the lower court, which upheld the commission, the illegality being that the City Council did not join the Mayor in calling the election. Since the election Guthrie has had two sets of city officers, one serving under the commission form, the other under the aldermanic. Much confusion in municipal affairs has resulted. J. Carter, Commissioner of Public Safety under the commission form, instituted mandamus proceedings against Chief of Police Mitchell, elected under the aldermanic form, to test the legality of the commission form. The decision is not considered as a test of the commission form and applies only to Guthrie. It is stated that there will be no action at present on the part of the commission advocates to have a new election, and the aldermen will probably be permitted to serve out their terms. A feature of this decision that may involve the corporate existence of other Oklahoma towns is the court's ruling that the adoption of a new charter by a city does not create a new municipal corporation.

Trenton Tax Rate Raised

Trenton, N. J.—At a special meeting the City Commission completed the budget for the fiscal year ending March 1, 1912, which provides for expenditures aggregating $1,228,647. This is an increase of about $35,000 over the apportionments fixed by the old Common Council, which was legislated out of office with the adoption of the commission government plan. The total increase over last year's appropriation is $80,000. The present tax rate in Trenton is $1.95. The Commissioners estimated that the new tax rate will be somewhere between $2.10 and $2.15. The salary apportionment made by the Commissioners was $3,000 in excess of that fixed by the old councilmen.

Lawton Adopts Commission Form

Lawton, Okla.—With a vote of 724 favorable and 264 opposing the city of Lawton last week adopted the charter providing for commission form of government. Every ward in the city, except the Fourth, gave overwhelming majorities for the charter. In the Fourth it carried by one vote. The total vote—988—is about 200 short of normal, but more than 100 votes which would have been cast were eliminated through conflict in registration regulations. A bitter fight was made on the charter by administration forces, while every newspaper in town favored its adoption. A court fight is still threatened before the change is accomplished.

Orange Does Not Want Commission Form

Orange, N. J.—By a majority of 88 votes Orange has rejected government by commission. The city will stick to the old form of government until the special committee of citizens appointed by Mayor Seymour makes its report on a new charter, and is adopted. Had the figures been the other way the outcome would have been the same, for the necessary 30 per cent. of last year's vote had not been registered in favor of commission government. The tally showed 1289 for and 1377 against it. The vote polled last year was 5300, so that 1600 had to be in favor of the new government if it was to have even a chance to win. The surprise of the vote was the strong opposition. It had been said in advance that the opponents of the plan would content themselves with merely keeping voters from the polls, but being registry day that was found early to be unpractical. The only open campaigning was done by the advocates of commission government, but the politicians of both parties were known to be working quietly against it.

Change in City Finance System

Providence, R. I.—City Auditor Philip S. Chase is preparing for the change in the system of financial accounting which will go into effect on Oct. 1 in this city. The details of the new plan are being carefully worked out, as there is a mass of routine to be gone through before the change can be made. In the new system, which was authorized by the City Council, all salaries and wages established by ordinance or statute and all salaries and wages of the officers, teachers and employees in the School Department, the officers and employees in the Fire Department and the Police Department are to be paid by voucher check. The City Auditor is to receive all such bills after they have been vouched for by the head of the department whence they come, and is to certify and file the same in books or on cards to be kept in his office for that purpose. It is provided, too, that the City Auditor shall make a daily schedule of the bills and accounts and shall forward those schedules to the Mayor, and that upon the approval by the Mayor of the bills on the schedule the City Treasurer is to receive them with orders to pay the same by voucher checks. The checks are to be sent by mail. The City Treasurer will not be required under the new financial system to keep accounts with appropriations, but is to keep such accounts only as may be necessary to show the complete cash transactions of his office. In the changing of the system the City Auditor's department is installing a complete new system of books and card indexes.

STREET CLEANING AND REFUSE DISPOSAL

Garbage Incinerator a Necessity

San Antonio, Tex.—Dr. S. Burg, City Physician, will in his annual report to Mayor Callaghan recommend "a more modern and more extensive system of collecting and disposing of garbage for the city of San Antonio." Dr. Burg said the report contains merely the recommendation for improvement in the serious problem of sanitation as regards the method of ridding the city of garbage, and this involves to a great extent the manner of hauling. Dr. Burg has broached no specific plan in his report, preferring, he said, to wait until the City Council is disposed to take up the matter thoroughly and with careful attention as to detail. The city, Dr. Burg suggested, could be divided into four districts and in each district could be located a spur track to the trolley traction system on which in some place fairly apart from a residence section, the city would station a box car to receive the loads of garbage wagons of the district. The method of dumping into the covered cars, he said, easily could be arranged so that it would give offense to no householder or neighborhood. Late at night these cars could be hauled over the tracks to an incinerator, where the contents would be destroyed. In this respect, thoroughly approving the use of an incinerator, the City Physician said all the delay and waste of teams and labor attendant on hauling every load to a remote dumping ground would be done away with. Instead of being put to a long haul the teams in each district, by dumping their loads in the neighboring receptacles, the box cars, would be enabled to make at least six trips a day to the houses and business places, instead of two, or one, as is now the case. Covered wagons are, of course, a very necessary part of the improved system.

Best Garbage System Under Commission Form

Moline, Ill.—Moline's representatives to the first regular meeting of the Commission Form of Government Association, of Illinois, during discussion of various problems confronting commission form cities, found that they have come nearer to solving the questions than any other Illinois city governed by the new business-like systems of the cities represented at the forenoon meeting of Commissions of Public Health and Safety—Elgin, Decatur, Springfield, Clinton, Pekin and Moline—this city is the only one in which the garbage is collected and disposed of by the municipality.

Wants Model Garbage Disposal System

Los Angeles, Cal.—Garbage disposal probably is the most important question to be taken up by Inspector Cushing, and already he is at work making it a study. According to his statements he never has made a study of it before and therefore approaches it with an open mind as to the merits of the different methods now in use. It is his hope that with the aid of the men under him and the co-operation of other city officials a method will be devised which will settle the question not only for Los Angeles but for other big cities as well. The first question to be settled is with respect to the collection and the extra service which is desired by the city. This will require a modification of the agreement with the firm now doing the collecting. This modification has practically been decided upon, the company to receive $2,283 a month extra for the additional service. The real problem, however, is with respect to the disposal, the present method of feeding to hogs being objectionable in many ways. Other systems, such as reducing, burning, etc., all are said to be more or less objectionable.

RAPID TRANSIT

Traction Subsidy Elections

Portland, Ind.—Subsidy elections have been ordered in Monroe and Wabash townships, Adams County, to aid in the extension south to this city of the Ft. Wayne & Springfield traction line. Both elections will be held October 11. In Monroe township $10,000 will be asked, while of Wabash $7,500 will be expected. It is thought the elections will carry, as a majority of the taxpayers in both places have pledged the payment of money necessary to obtain the road's right-of-way and to build depots. Portland has been slow in responding to the demands made to secure the extension. To purchase the right of way from this city north to the county line it is stated that $4,000 will be required, of which less than half has been pledged. It is said that the extension of the line is in danger through the indifference of those who have been expected to be interested here. The ability of the company to finance the work, it is stated, depends on the guaranty of the right of way.

To Develop Transit System

Boston, Mass.—The Boston Elevated Railroad Company plans to expend about $60,000,000 during the next three and a half years in developing the transit system of Boston, it has been announced. Power for the expanded service will be generated in a new station that can supply an alternating current up to 30,000 kw. Six transforming stations will be subsidiaries of the new plant which will require 142 miles of underground circuit.

New Subways for Boston Guaranteed

Boston, Mass.—Stockholders of the West End Street Railway Company at a special meeting held in Wesleyan Hall voted overwhelmingly to sell their property, privileges and franchises to the Boston Elevated Railway Company. A merger of the two companies is thus virtually effected on terms which the public in large measure has dictated and a question settled which has been absorbing much attention in the Legislature and in the public discussion for several years. Incidentally this vote assures two important new subways for Boston and one tunnel extension, in that it obligates the Boston Elevated to undertake at once the construction of one subway under Boylston street and another from Park street to South Station and out through South Boston to Andrew square in Dorchester.

Franchise Granted in St. Johnsville

St. Johnsville, N. Y.—At an adjourned meeting of the Village Board a franchise and right of way was granted the Little Falls & Johnstown Railroad Company, the route entering the village on the west at Hough street, crossing South Division, Mechanic and Bridge streets, taking New street, crossing Kingsbury avenue and Ann street, and leaving the village by way of Lion avenue. Provision was made for subguarding the rights of the village in regard to disposal of snow and the erection and maintenance of a station. This, it is understood, will be located at the Bridge street crossing.

Census of Traction Companies

Washington, D. C.—Statistics recently issued show that there are 1279 traction companies in the United States, Ohio, of the central States, being in the lead with 91, Illinois second with 85, Indiana third with 47, Iowa fourth with 30, Wisconsin fifth with 26, Missouri sixth with 23, Michigan seventh with 22, Kentucky eighth with 11 and Minnesota ninth with nine. Illinois has the greatest number of cars in service. These companies have 40,088 miles of track and their authorized capital is $3,135,443,005.

Ready to Electrify Line

Chehalis, Wash.—The material is now all on hand for the electrifying of the line of the Chehalis & Cowlitz Railroad from the junction with the Chehalis-Centralia interurban line on John street to a point a mile and a half south of town. It is expected to have cars running by electricity by the end of the week. The Chehalis & Cowlitz Railway Company has received a big shipment of steel to lay its track from the State Training School south and eastward to the Newaukum River and work will be pushed with vigor.

Valuations of Roads

Olympia, Wash.—The valuation of the Spokane International Railway has been placed at $1,175,000 by the Public Service Commission and certified to the State Tax Commission. Other figures given out show that the valuation placed on the Spokane Inland is $14,500,000, while the Washington & Idaho Northern is valued at $4,400,000. The valuation on the Puget Sound Railway Company will be placed at about $4,800,000 and that of the Tacoma Eastern at approximately $4,000,000.

MISCELLANEOUS

To Beautify Approaches to Station.

Detroit, Mich.—Broad and handsome approaches to the new union station from Michigan avenue are to be urged upon the city officials and the public by the City Plan and Improvement Commission as an imperative necessity, the planning and construction of which is the very first thing to be taken up in the movement to make Detroit the most beautiful and harmonious city on the North American continent, according to Charles Moore, the president of the commission. "It has been often stated," said Mr. Moore, "that the first impression a visitor gets of a city remains with him always, and has much to do with his decision as to whether he wants to live there or invest his money there, and nothing is more true. One way of looking at it, that is a sordid motive for our wishing to make the main entrance to the city a beautiful one, but regarded in a broader spirit it is not sordid, it is patriotic and public spirited."

To Plant Thirty-four Miles of Trees

Los Angeles, Cal.—Plans have been outlined by the County Forestry Commission to begin the beautifying of the new highway system the coming winter by planting trees and shrubbery along the roads. The Commission has recommended to the Board of Supervisors that a start be made on Long Beach boulevard, one of the highways to Santa Monica and one to Pasadena, a total of 34 miles. This would require a total of 19,620 trees, and the Commission says it can plant and care for them for $1 each. To do this and care for its incidental expenses the Commission asks an appropriation of $25,000 for the coming year, provided the board wishes to begin the ornamentation of the highway system. The Commission was asked by the board to make its request in writing and the Supervisors will consider it formally when the annual budget is made up.

Urge Fireproof Roofing for All Buildings

New Bedford, Mass.—The equipment of every roof in the city with fireproof roofing and opposition to the wooden shingle embody the opinion of Justus A. Briggs, Jr., as to what the provisions of the new building code should require. When Mr. Briggs was asked to give his opinion on the new code he replied that he is not familiar with the wording, but is heartily in favor of a very much stricter building code than the one now in force. "The code should be so framed as to work the least hardship upon those who build and yet to compel everybody to obey certain reasonable and necessary restrictions. I am not certain but that in certain districts all buildings should be fireproof. All buildings in the first fire district should be equipped with slate roofing, whether the buildings are old or new, and every building in the city should have a fireproof roof. I believe that wooden shingles should be done away with in this city. The main danger in cases of fire in a high wind comes from burning shingles carried to places distant from the original fire and setting fresh ones. Sparks from a chimney are sometimes carried to wooden shingles and a fire thus started. I believe we have an efficient fire department, equal to any and able to cope with any emergency. Conditions in this city, however, are such that we should fear and provide against disasters like the Chelsea and Portland conflagrations."

Philadelphia Claims Finest Pier in World

Philadelphia, Pa.—Acting Director Hasskarl has announced that bids would be opened soon for the new municipal pier to be constructed at Dock street. The Director expects to open the other new municipal pier, below Vine street, early next month, as it has been rushed to completion in record time, despite the fact that many unexpected delays and difficulties were encountered. The Vine street pier is claimed to be the finest structure of its kind in the world, and as the Dock street pier will be similar in every particular, shipping men are eager to have work started on the latter. Practically all the available space at Vine street has already been engaged by marine interests and arrangements are already being considered for accommodations at the Dock street pier.

City Will Buy Its Own Cement

Los Angeles, Cal.—Sale by the city of Los Angeles to the city of Los Angeles of 2000 barrels of Portland cement is recommended by the Board of Public Works in a communication to the City Council. The cement was manufactured in the city's plant at Monolith, which is operated in connection with the Aqueduct Department, and the board recommends that it be sold to the Bureau of Street Maintenance and Inspection at a price of $1.30 a barrel, f.o.b. Monolith, sacks to be returned or paid for at the rate of 10 cents per sack, plus freight on return sack shipment. The transaction has been approved by the Aqueduct Board and Advisory Bureau and similar confirmation is asked of the Council.

To Clear Streets of Wires

New York, N. Y.—Borough President Steers will make an effort to have Coney Island avenue, of which it is intended to make a beautiful parkway, cleared of all the overhead wires except the trolley wires of the Coney Island and Brooklyn Railroad. Mr. Steers, through his secretary, John B. Creighton, sent to the Highways Department for a list of the companies and city departments which have wires strung above ground. Complaints have been made by residents along Coney Island avenue of the unsightliness of the wires and the poles they are on. The records of the Highway Department show that the Flatbush Gas Company, the Edison people, the telephone company, the Western Union and the Police and Fire departments, all have overhead wires on Coney Island avenue. Mr. Steers said that it is not within his jurisdiction to order the wires removed, but that it is a matter for the Board of Estimate to consider.

Will Straighten Street and Track for Safety

Troy, N. Y.—As the result of an accident, when a street car became unmanageable on the hill at Binden and Stowe avenues and four people were thrown off sustaining serious injuries, the city will straighten the street. Several persons have been injured before at the same place. The car tracks now form a letter S in the middle of the hill.

Dog Muzzling Ordinance Must Be Enforced

Chicago, Ill.—Recognizing the public danger in having numbers of unmuzzled dogs overrun the streets, attacking children and adults in large numbers and endangering the community by the spread of the hydrophobia germ, Mayor Harrison has issued an order that he declared means the dog muzzling ordinance must be enforced. Chief of Police McWeeny, who aroused the medical profession by his disregard for the ordinance during the Mayor's absence, was ordered to assign special policemen to notify owners of dogs that prosecution will follow their failure to muzzle all canines; also to instruct the dog catchers to inaugurate a special campaign "to bring about the impounding of every unmuzzled dog in the city" and to awaken every policeman on the force to his duty in this respect. Eight persons, including a city policeman, were bitten by vicious dogs, and four other persons are in danger of infection from hydrophobia germs, according to reports on the dog scourge. Mayor Harrison has had some experience with vicious canines and told the Chief of Police he wanted the Police Department to get busy, as the really dangerous period when dogs bite the most is to come after the hot weather is gone, and the next six weeks or two months will be the most dangerous period.

City's Bath Houses Liberally Patronized

Louisville, Ky.—During the fiscal year which ended August 1, 78,651 persons took baths in the public bath houses of Louisville. This breaks all former records and shows that the public baths are very popular. Each bath taken during the year cost the city 6¼ cents. The total operating expenses of the bath houses for the year was $4,926.61. Louisville has three bath houses; of these the Eighteenth street bath house leads with 27,333.

To Economize in Automobiles and Extend Usefulness

Los Angeles, Cal.—That actual economy may characterize the operation of county automobiles and that all county officials may have access to them instead of a chosen few. County Auditor Lewis, at the request of Supervisor Sidney A. Butler, is preparing a report on the cost of operating machines, to be submitted to the Board of Supervisors at an early date. Suggestions by heads of the various departments will be requested at a meeting to be held preparatory to the filing of the report with the Supervisors. It is said that careless handling on the part of some of the officials has brought the cost of running the machines considerably above the average figure. It is planned that all county officials in the course of their duty be permitted to use the county cars.

Plan to Bond Auto Drivers

Richmond, Ind.—Mayor W. W. Zimmerman of Richmond has a plan to cope with the reckless auto drivers. "I favor a law to repeal the present speed laws and provide that the owner of every automobile when registering his machine and receiving a number from the Secretary of State shall be compelled to file bond in a penal sum of not less than $5,000. In case the automobile injures a citizen of this State action on the bond may be taken. I believe this would be the means of reducing the number of reckless and incompetent drivers to the minimum. Under the existing laws the incompetent driver is responsible for more accidents to pedestrians than the speeder."

Ordinance to Stop Auto Whistles and Other Noises

Sioux City, S. D.—No longer will the screech of the siren whistle or the earsplitting noise that emanates from devices on automobiles and motorcycles to warn off impending danger be permitted in Sioux City, if an ordinance placed on first reading in the City Council becomes effective. In accordance with the recent State law affecting motor vehicles Councilman R. S. Whitley and F. E. Gill, City Attorney, have drawn up a new ordinance which not only embodies everything contained in the old one but several new features. They are: The use of any horn or noise making device, except the bulb horn, is prohibited; motor vehicles shall not be run on the streets with the muffler cut out; the speed shall not be more than one mile in four minutes or 15 miles an hour (in parks the limit is eight miles an hour); the State law makes it incumbent on city authorities to fix a speed limit and says that 25 miles an hour shall be deemed imprudent; motor vehicles of the Fire and Police departments and ambulances are exempt from the speed limit.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Change of Grade—Court Review

Stocks vs. City of Gadsden.—A bill to enjoin street grading work charged that the lowering of grade was not necessary to make the street safe and convenient, but would cause such street to be four or five feet lower than complainant's property, and render ingress and egress to and from it difficult. Defendant's sworn answer did not take issue with the averment as to difficulty of ingress and egress, but in explanation averred that the grading would lower the street only one and one-half feet for a short distance, and that the cost of making complainant's property conveniently accessible would be small, and the grading would enhance its value. Held that, even if the court had power to control the riscretion of the city in cases where great abuse of discretion was shown, no construction of the answer would require such review.—Supreme Court of Alabama, 52 S. R., 134.

Violation of Ordinances—"Law"

Dowling vs. City of Troy.—A complaint by a city filed in the Recorder's court of the city which alleges that accused committed the prohibited act within the police jurisdiction, contrary to law and in violation of an ordinance of the city, charges a violation of the ordinance, for the word "law" may include an ordinance, and accused must know that he is prosecuted for a violation of an ordinance of the city.—Appellate Court of Alabama, 56 S. R., 116.

Street Tax—Constitutionality

City of Montgomery vs. Barefield.—Under Code 1907, providing that the inhabitants of any municipality shall be exempt from working on the highways outside the city, and may be required, for the support of the street within such limit, to pay a street tax, the city of Montgomery enacted an ordinance imposing an annual street tax of $3 upon every inhabitant between the ages of 21 and 45. Constitution prohibits the Legislature from authorizing any municipal corporation to pass laws inconsistent with the general laws of the state. The classification used in this ordinance was in accordance with the classification used in other legislative enactments. Held, that while Code 1907 imposing the general highway taxes made a slightly different classification and imposed slightly different duties, the ordinance was not in conflict with those sections, being a substitute therefor, and hence was not in violation of the constitutional provision.—Appellate Court of Alabama, 56 S. R., 260.

Water Company—Taxation

Beauty Spring Water Co. vs. Village of Lyons Falls.—A water company holding a franchise to operate its system within a portion only of the limits of a village is subject to taxation of its property located within the village for the purpose of paying bonds issued and expenses incurred for the maintenance of a municipal water system installed subsequently to that of the water company. When a municipal corporation is created, the power of taxation is vested in it as an essential attribute for all the purposes of its existence, unless its exercise be in express terms prohibited.—New York Supreme Court, 130 N. Y. S., 845.

Ordinance—Two-Thirds Vote

City of Denver et al. vs. Rubridge et al.—Denver City Charter requires an ordinance directing the erection of a storm sewer to be passed by a two-thirds vote of the council; an article provides that a majority of the members elect of each board shall be a quorum to transact business; and a section provides that no action of either board, except an adjournment, shall have force, unless a majority of the members elect vote in favor thereof. Held, that charter does not mean a two-thirds vote of all the members, but "city council" means a quorum of each branch, and a two-thirds vote of each of such quorum, provided such vote constituted a majority of all the members elect to the branch in which such vote was taken.—Supreme Court of Colorado, 116 P. R., 1130.

Private Fire Alarms—Contract with City

National Automatic Fire Alarm Co., of Oregon, vs. City of Portland et al.—Where the owners and operators of an electric contrivance designed to furnish private parties with means of giving alarms of fire as an adjunct to the general alarm system of a city, addressed a communication to the Board of Fire Commissioners, stating its desire to install its system, and the record of the Board of Fire Commissioners shows that that it was agreed that if, after a thorough investigation by the chief, the system was deemed advisable, it would be adopted, and a later record showed that it was ordered that the board enter into a contract with the fire alarm company for a system of auxiliary alarms, "said contract to be satisfactory when submitted," the action of the superintendent of the city's fire alarm company in connecting such private alarms with the wires of the city did not complete a contract; no written contract having ever been submitted or no time specified or terms made as to the manner of connection or regulation.—Supreme Court of Oregon, 117 P. R., 285.

Suspension of Firemen

Glynn vs. City of Oswego.—Where a regularly appointed fireman in the city of Oswego was suspended without pay for violating the rules of the department till the next meeting of the department five days later, when action on the charges was postponed to a subsequent meeting, two months later, when a motion for his reinstatement was lost by a tie vote, the suspension was lawful under a rule of the department authorizing the suspension of a fireman for insubordination or neglect of duty, he not being a city officer in view of Oswego city charter, enumerating the employees of the city, but not naming firemen, and he was not relieved from the operation of such suspension by the action of the department.—Oswego, N. Y., County Court, 130 N. Y. S., 860.

Harbor Areas—Streets—Slip

Chlopeck Fish Co. et al. vs. City of Seattle et al.—The State filed a plat of a city's tideland and waterfront and extended every alternate street of the city running to the waterfront in a direct line over the tidelands to the outer harbor line. Thereafter the city prepared a corrected plat, whereon the streets were extended at an angle. The Legislature instructed the State Land Commissioners to revise the original plat to conform thereto. The city's corrected plat designated the streets and had the words "city slip." The deflection of the streets from a straight line was advantageous for all interests concerned. Held, that the words "city slip" indicated that a space, whether a slip or street, was dedicated to the city for public use, and conferred power on the city to improve it for that use by the public.—Supreme Court of Washington, 117 P. R., 232.

Mileage Charges of Police Officer

State ex rel. Wynne vs. Examining and Trial Board of Police Department of City of Butte et al.—Under Revised Codes, which declares that a sheriff, constable or other peace officer traveling in the discharge of his duties shall charge only for each mile actually and necessarily traveled, a chief of police had no right to claim mileage for the distance traveled by an officer, or for any services which he has not actually performed; and that he believed that he had a legal right to charge such mileage and acted in good faith in taxing and collecting it, the fact that other such officers have made similar charges, and that his claim was paid and his appointment made permanent after the disputed charge, constitute no defense.—Supreme Court of Montana, 117 P. R., 78.

Diversion of Streams—Injury by Floods

Willson vs. Boise City.—Where a city, to prevent damage by floods of a stream, diverted it where it issued from the canyon into an artificial channel, which was not made large enough to carry off water in times of heavy floods, whereby plaintiff's lands were damaged, the city cannot escape liability therefor, because after the diversion the owner of lands, at the point of diversion, through which the original channel ran, raised the wall of the new channel so as to prevent flood water from damaging the lands, thereby throwing the entire volume of flood water into the new channel.—Supreme Court of Idaho, 117 R. R., 115.

MUNICIPAL APPLIANCES

Fire Extinguisher for Gasoline Fire

THE Chemical Fire Extinguisher Co., Newark, N. J., has placed on the market a chemical fire extinguisher invented by George J. Hamberger, assistant superintendent of the salvage corps of the underwriters' protective associations of Newark, N. J. The object of the inventor in perfecting this device was to make an extinguisher of a more substantial and durable character and of greater capacity than those now on the market. Some extinguishers for gasoline are so lightly constructed that they rust out in a few years without ever having been used. This extinguisher, although a benificent device in itself, is called the Savage Red Devil, presumably from the point of view of its enemy. It is constructed throughout of non-corrosive metal, brass or bronze, of sufficient thickness and weight to insure it against injury even from very rough handling. The extinguisher is always ready for use. A simple movement of the handle as in a garden syringe, an operation so obvious that a person who has never seen one before can at once understand how it is operated, will instantly extinguish a small gasoline fire. As the extinguisher contains a quart of the chemical, it is readily seen that a fire even of considerable extent can be extinguished. The Savage Red Devil is effective against fires of gasoline, naphtha, oils, varnishes, celluloid, calcium, carbide, electric arcs and, in fact, all combustibles.

London's Portable Fire Escapes

PORTABLE fire escapes mounted on two-wheel trucks and carried on fast electric vehicles, are one of the most distinctive features of the rescue equipment of the London fire brigade. The most important part is a seventy-five foot extension ladder, to which is attached a long canvas chute. Through this chute, persons who have been trapped on the upper floors of a building drop to the street. The lower end of the canvas is looped up in order to arrest the fall.

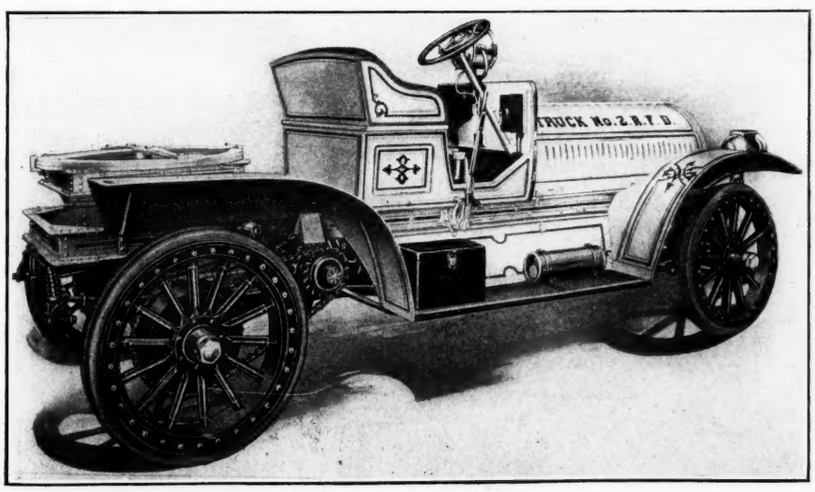
For many years there were maintained in various parts of London, isles of safety. A corps of firemen at each had sufficient apparatus to fight any small blaze, and was provided with the portable escape. The fire escape is adapted to use in crowded sections of the city, where there are innumerable alleys, so small that the regular apparatus could not get near a burning building. London is the only city maintaining such fire equipment.

With the improvements in electric-driven vehicles changes have come in the London fire-fighting system. The isles of safety are gradually giving way to the electric apparatus and the fire escape is now mounted on an auto. As it is necessary for the vehicles to cover great territory, the range of usefulness of the escape is extended.

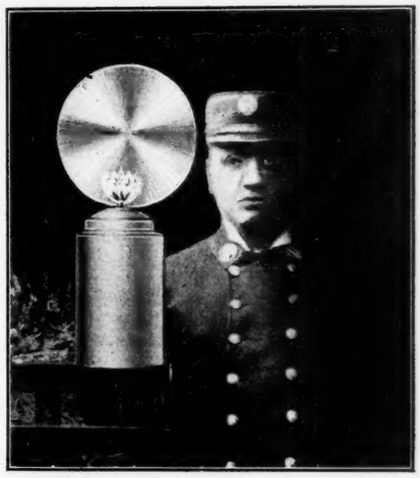
Three such electric vehicles were recently delivered by Cedes Electric Traction Company, Limited. The order was secured from the London County Council only after the vehicle had been put to the severest kind of a test. The fully loaded machine attained a speed of twenty-six miles an hour on the level, climbed the Pentonville Hill (one in twenty-four) at a speed of sixteen miles an hour, and made the run of twenty-five miles out from Pentonville and back in one hour and a half on one charge. One of the vehicles has covered eight hundred miles since going into service, and several times has done thirty-five or forty miles on one charge.

The vehicle consists of a chassis, with battery, motors and control equipment, a light body with the gear for holding the fire escape, and a small pumping set, which is used previous to the arrival of the regular fire engines.

The total weight, including the escape and a crew of five men, is five tons five hundredweight. The battery is of the Tudor Company's make, and comprises eighty-four cells of a total weight of twenty-six hundredweight, giving two hundred ampere hours at the four-hour rate. Two hub motors of the Mercedes pattern are provided, one in each of the front wheels. These motors are rated at twenty horse-power each.



MOTOR FOR PROPELLING ANY HEAVY FIRE APPARATUS



LIGHT THAT PENETRATES SMOKE

Firemen's Search Light

THE Marine Torch Company, 226 North Gay street, Baltimore, Md., manufacture a fireman's search light which is ignited by the action of water coming in contact with certain chemicals. The light burns for one hour and is of 400 candlepower. The light is easily carried about on fire apparatus, taking up but little space. In shape for transportation it is simply a cylindrical can about 15 inches high and eight in diameter. In use it has a reflector and will project light through dense smoke.

Tractor for Fire Apparatus

THE Seagrave Co., Columbus, O., manufacture a tractor so designed that it can be placed under any horse-drawn hook and ladder truck, aerial truck or steam fire engine. The horse-drawn apparatus need not be taken out of service to be rebuilt. All the changes required are to take the front wheels and horse pole from under the apparatus and back the chassis under, couple up the king bolt and the job is finished.

GENERAL DESCRIPTION:

Frame—Of channel steel, ample size.

Springs—Special for this particular work, lipped and clipped.

Axles—I-beam front 2½ inches, solid square rear 3 inches.

Wheels—Wood, artillery type, with brass hub caps.

Tires—Solid side flange type of ample size, fronts single, rear dual.

Motor—Either 4-cylinder 50 H. P., 6-cylinder 80 H. P. or 4-cylinder 90 H. P. to meet the requirements. Either air or water cooled. Motor placed in front of operating stand.

Ignition—Dual. Two independent sets of plugs supplied by battery and high tension magneto of any desired make.

Transmission—Three speeds forward and one reverse, selective sliding gear type.

Drive—Double side chain to rear wheels.

Brakes—Two on jack shaft and two in rear wheels.

A 1,000-Gallon Capacity Auto Fire Engine

THE automobile fire engine, shown in the accompanying illustration, is a very simple and direct combination of a high-powered gasoline motor and a modern high-duty turbine pump.

The illustration shows diagrammatically the arrangement of the essential members and is not intended to show constructional details. Four members constitute practically the entire machine; namely, the motor, the pump, the clutch and the transmission. The necessary piping is shown wholly by diagram, making it easier to follow. The intake and discharge from the pump are shown as if located in a vertical plane so as to make the construction more apparent. In a working machine the plane of the intake and discharge connections would be placed at an angle of about 45 degrees with a vertical plane and so make these connections more accessible.

It should be quite apparent from the illustration that the motor drives the car through the straight pump shaft, clutch, transmission gears and chains to sprockets on the rear wheels.

The detail view of the pump shaft and impellers shown below the pump will show the form of the only moving part of the pump, and this shaft is carried in outside bearings bolted onto the pump casing as shown.

This pump shaft thus constitutes a part of the driving or propeller shaft of the automobile and the pump impellers or wheels constitute the flywheels of the driving motor. When no water is being pumped, they simply revolve in air and absorb an inappreciable amount of power.

On arriving at a fire, the simple disconnection at the clutch leaves a combination of a direct connected gasoline motor and turbine pump.

The pump shown is the combination of two two-stage pumps housed in one single casing with one pair of outside bearings. There is a division plate between the two sides of the pump and this arrangement is just as efficient as two separate pumps and is also more compact, lighter and better adapted to the work.

This combination of motor and pump has shown under a series of tests to be able to deliver over 1,000 gallons per minute against 120 pounds per square inch pressure. When delivering this amount, the water enters the pump at the common suction connection A and passes through the branches B and C to the suction ends of each side of the pump.

The discharge of 500 gallons per minute from each side leave at C and D and pass to discharge manifold E, to which the hose connections are made.

If high pressure is desired, the pump can be made to operate as a four-stage pump by closing the valves at G and F and opening that at H. Then 500 gallons of water at 120 pounds pressure discharged at D will pass through H to the intake of the left-hand pump and leave it at C at 240 pounds pressure.

Variation of the speed will, of course, vary both the capacity and head so that the output is not rigidly confined to the figures given. Indeed, the discharge may be shut off entirely when the motor is running at top speed without danger, for the water in the casing simply turns around with the impellers.

The automobile frame, cross members, and general equipment are not shown, but since the addition of the pump adds only about 600 pounds weight, the car construction may be almost that of a touring car, including pneumatic tires.

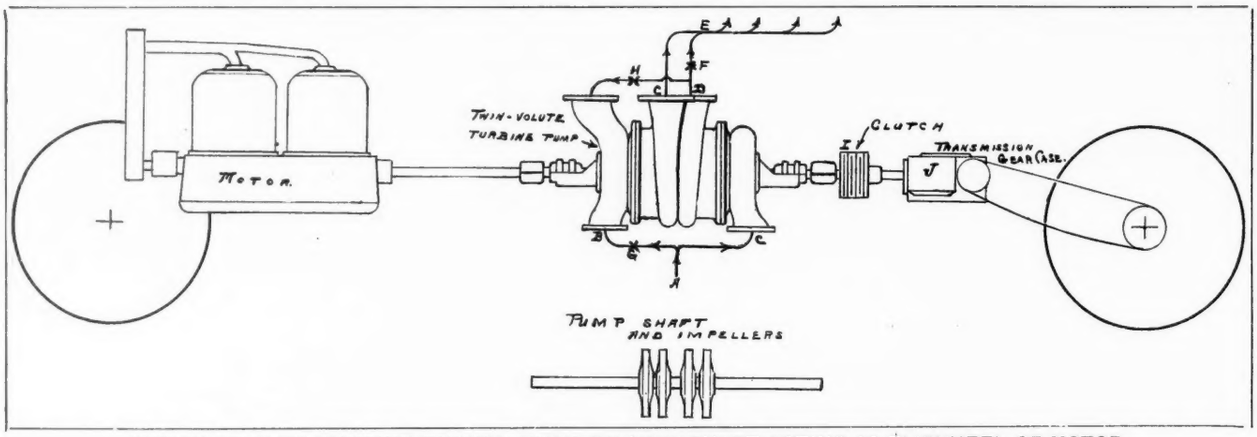
The design provides space for a considerable quantity of hose and seats for at least six men.

As the car is very light, comparatively, the speed will be very high, for the motor develops over 100 horsepower.

This should easily drive this car at 60 miles per hour or better.

Broad patents have been allowed on this combination and arrangement to the designer, Mr. Leon B. Lent, Brewster, N. Y.

The apparatus is not yet on the market.



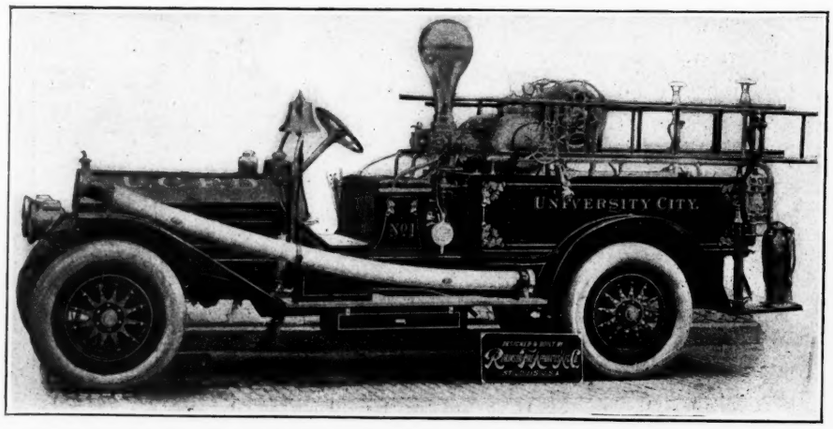
DESIGN OF AUTO PUMPING ENGINE—PUMP ON MAIN SHAFT ACTING AS FLYWHEEL OF MOTOR

Steel Wheels

THE Electric Wheel Company, Quincy, Ill., makes a specialty of manufacturing strong steel wheels with wide tires adapted for the use of heavy vehicles and trucks carrying contractors' portable outfits of any sort. The company also makes trucks suitable for use with these wheels. These wheels are adapted for use in traction trains where loads weighing up to 20 tons are carried. Extensive factory facilities make it possible to turn out wheels of any desired height, width of tire and weight carrying capacity. The wheels may be fitted with either steel or wooden axles. The spokes of the wheel are of steel and are staggered; that is, a spoke from the inner side of the hub runs to the outer side of the rim or tire and the spokes from the outer side of the hub run to the inner side of the tire. Where a complete truck is furnished a substantial brake is operated from a wheel at the driver's side.

Triple Combination Motor Apparatus

The Robinson Fire Apparatus Company, 4250 North Twentieth street, St. Louis, Mo., manufactures a large piece of motor apparatus which is a small fire department in itself. It contains devices for attacking a fire in about every way known. Primarily a pumping engine rated at 750 gallons capacity from a dead suction against a pressure of 120 pounds, it carries a 40-gallon chemical tank, both chemical and fire department hose and hooks, ladders and minor equipment besides. The gasoline motor is of 110 horsepower. The pumps are piston pumps. The chassis is of substantial construction, suitable for carrying a heavy load at high speed. The suction pipe is carried on the side of the car on brackets, held in a straight position.



PUMPING ENGINE, CHEMICAL AND HOSE WAGON

NEWS OF THE SOCIETIES

Illuminating Engineering Society.—The fifth annual convention will be held at the Congress Hotel, Chicago, September 25 to 28, Monday morning to Thursday noon, inclusive.

The topics to be presented and the speakers at the various sessions include the following:

Presidential Address—Dr. A. E. Kennelly, Professor of Electrical Engineering, Harvard University.

The Manufacture of Glass from the Viewpoint of the Illuminating Engineer—E. H. Bostock, New York.

Illuminating Glassware—A symposium by Bassett Jones, Jr., G. H. McCormick, A. J. Marshall and L. W. Young.

The Law of Conservation as Applied to Illumination Calculations—A. S. McAllister, Associate Editor, *Electrical World.*

Recent Small Gas Lighting Units—F. H. Gilpin, Gas Engineer, United Gas Improvement Co., Philadelphia.

Report of Committee on Nomenclature and Standards—A. J. Humphries, Chairman.

Study of Reflections and Reflecting Surfaces—F. L. Godinez, Jersey City.

The Relation of Shadow to Relief Design—Bassett Jones, Jr., Electrical Engineer, New York.

Recent Developments in the Manufacture of Incandescent Lamps—J. E. Randall, Director, Lamp Development Laboratory, National Electric Lamp Association, Cleveland.

The Photometry of Lighting Units of High Intensity—Geo. H. Stickney and S. L. E. Rose, General Electric Co., Harrison, N. J.

Photometry at Low Intensities—Dr. Louis Bell, Consulting Engineer, Boston.

The New Quartz Tube Mercury Arc Lamp—Geo. C. Keech, Illuminating Engineer, Cooper Hewitt Electric Co., Chicago.

Evaluation of Lamp Life—Preston S. Millar and L. J. Lewinson, Electrical Testing Laboratories, New York.

Influence of Surroundings and Lighting Systems on the Illumination Required—Jas. R. Cravath, Illuminating Engineer, Chicago.

Flames Carrying Electric Current—C. F. Lorenz, National Electric Lamp Association, Cleveland.

The Production and Form of Natural Gas from the Illuminating Engineer's Standpoint—George S. Barrows, United Gas Improvement Co., Philadelphia.

Distribution of Luminosity in Nature—H. E. Ives, Physicist, National Electric Lamp Association, Cleveland.

Light Distribution—Its Influence Upon Illuminating Efficiency and Visual Acuity—A. J. Sweet, Commercial Engineer Holophane Co., Newark, O.

Résumé of Legislative Enactments on Illumination—E. L. Elliott, Editor, *Illuminating Engineer.*

Selling Illumination—Frank B. Rae, Jr., Editor, *Selling Electricity.*

Report of Committee on Progress—Louis Bell, Chairman, Boston.

The following entertainments have been prepared: Monday evening—Reception and dance. Tuesday afternoon—Inspection trips by automobiles. Choice of trips to numerous points of interest, including the Fisk street station of the Commonwealth Edison Co., the Peoples Gas Building, Armour Institute, Lewis Institute, Chicago University and the International Municipal Congress.

For visiting ladies: Monday afternoon—Automobile drive up the north shore through Lincoln Park and a part of the famous Sheridan Road to the Mission Tea Room. Monday evening—Reception and dance in the Florentine Room of the Congress Hotel. Tuesday afternoon—Automobile trip through the South Parks, passing Chicago University, to the South Shore Country Club. Wednesday afternoon—Theater party. Wednesday evening—Subscription banquet.

Those attending this convention will be in time for the International Municipal Congress (including the session at which Bion J. Arnold, H. M. Byllesby and E. M. Bemis will discuss "Public Utilities") and for the exhibit of original pen drawings by Orson Lowell at the Art Institute, which is already famous for its collections of French, Dutch, Japanese and American masterpieces. Also for the new fall offerings at the various theaters.

In addition to such items of general interest, opportunities will be offered for viewing some striking effects in illumination, such as the vistas afforded by the new lighting of Michigan boulevard, the high pressure gas lamps at the Peoples Gas Building, the indirect lighting equipment in several Michigan avenue hotels and the different lighting methods used by prominent State street stores.

American Association for Highway Improvement.—Recognizing the American Association for Highway Improvement as the national good roads organization of America, the Permanent International Association of Road Congresses, in which thirty-five nations are officially represented, has designated it to be the correspondent of the international body in the United States.

In a letter just received by J. E. Pennybacker, Jr., executive secretary of the American Association for Highway Improvement, the president of the International association, who is also inspector general of the superb road system of France, says:

> We propose to consider your association as our correspondent in the United States and to depend on it to harmonize the studies which it has undertaken with those which are proceeding in the different countries represented in the Permanent International Association.
>
> Thanks to the high patronage of the President of the United States and to the influence of the members of the Bureau of Directors and important personages who have taken the initiative in the creation of your association, it seems to us that your association must certainly have a great development rapidly, and that it will succeed in order to combine their efforts in grouping the numerous associations which have been or may be created in the different States of the Union. We have also learned with pleasure that your association proposes to do all that will be in its power to obtain the official association of the Government of the United States in the Permanent International Association of Road Congresses.

The letter calls attention to the fact that the United States is the one great power that is not officially represented in the international association to which other nations have designated representatives through diplomatic channels. The international association was formed for the purpose of international cooperation and exchange of thought and experience in road building and the greatest engineers and scientists of the world have attended the great road congresses that have already been held. The first congress was held in 1908 at Paris; the second in 1910 at Brussels, and the third is to be held in 1913 at London.

Now that the American Association for Highway Improvement has been officially designated by the international association as the representative of the United States and the American correspondent, Secretary Pennybacker announces that the American association will make an effort to bring the next international congress to America. After the convention at London in 1913 two years will probably elapse before the next congress and this will give the officials of the American association plenty of time to agitate the question. They will make their plea for the next congress when they attend the one that is to be held in London. Mr. Pennybacker said in an interview:

> I am particularly gratified that our association has been named as the American correspondent of the International Association. The president of our association, Mr. Logan Waller Page, who is the director of the Office of Public Roads, was named by President Roosevelt as chairman of the Commission to the Paris Congress, and inasmuch as we are trying to do for the United States what the International Association is trying to do for the world, we feel that the arrangement entered into will prove mutually satisfactory.
>
> France, of course, has the greatest system of public roads in the world, built at a cost of $613,000,000, and now practically completed. The most striking feature of the French system is the thorough and continuous maintenance by a force of 50,000 patrolmen who devote their entire time to the care of the roads. America is derelict in road maintenance, but leads the world in the development of labor-saving equipment and methods, and so we feel that, while their experience and knowledge will be valuable to us, ours will be equally valuable to them.

American Association for Highway Improvement.—As a result of a joint meeting of manufacturers of road machinery and materials and representatives of the American Association for Highway Improvement held in New York, plans have just been formulated by the committee appointed at this meeting for a convention of manufacturers at the great road congress of the American association at Richmond, Va., November 20-23, 1911.

The manufacturers will hold their meeting on the afternoon of November 21, following the sessions of the highway engineers, contractors and officials, and at that time expect to perfect a permanent organization for the purpose of aiding the cause of road improvement and to co-operate with the American association and other similar organizations.

Pending the formation of a permanent organization of manufacturers at Richmond, the committee appointed at the New York conference is actively cooperating with the American Association for Highway Improvement in its efforts to make the Richmond congress the most important and influential event of its kind ever held, as well as aiding the association to make its general work most effective. The manufacturers' committee is composed of Nat Tyler Jr., president of the Monarch Road Roller Co., chairman; Daniel T. Pierce of the Barber Asphalt Paving Co., secretary; J. S. Robeson, president of the Robeson Process Co.; C. E. Woodbridge, of the Texas Co.; W. T. Beatty, of the Austin-Weston Co., George H. Lewars, of the Good Roads Machinery Co., and J. E. Pennybacker, Jr., secre-

tary of the American Association for Highway Improvement.

No exhibits of machinery or materials will be made at the Richmond congress, as it appears to be the unanimous opinion of the manufacturers that exhibits have proven unsatisfactory in the past and should be eliminated as a feature of all future road conventions.

National Municipal League.—The date of the annual meeting for 1911 is November 13-16 and the place Richmond, Va. Clinton Roger Woodruff, 705 North American Building, Philadelphia, Pa., is secretary.

American Road Builders' Association.—At a meeting of the board of directors of the American Road Builders' Association, held at the Hotel Astor, New York City, on September 2, it was voted to accept the invitation of the city of Rochester, N. Y., to hold the next annual convention of the association in that city, November 14 to 17, inclusive.

The sessions of the convention will be held in Convention Hall, a building erected through an appropriation of the common council of the city especially for the accommodation of gatherings of this kind. An exhibition of road building machinery and materials, similar to those which have added so much to the value of former conventions of the association, will be held this year. The convention hall seats 4,000, and the exhibition hall, under the same roof, offers about 35,000 square feet of floor space in the two floors and basement which are available.

The unusual facilities afforded at Rochester will do much to enhance the success of the convention, and the directors of the association feel that the city's favorable geographical location insures a large attendance. Rochester is well known throughout the country as a convention city, and probably no city in the country has a greater variety of up-to-date roads and pavements. During the past year conventions of the Grand Army and the Mystic Shriners have been held there, and the hospitality of the city is well known.

The date selected was the only one available before the first of next year, unless the convention were held earlier in November. On account of election this was thought inadvisable, and the date chosen is considered as the best possible, as it is late enough in the season so that highway officials, engineers, contractors and others will be able to attend without leaving their work during the busy season.

The program has not yet been made up, although at the last meeting of the board of directors it was decided that the papers and discussions should be limited to the subjects of organization, construction and maintenance. According to the present plans, each paper presented will be discussed by two delegates, previously selected, after which the discussion will be open to the convention. At least one session will be given up to contractors.

The seventh annual convention held at Indianapolis last December brought together upwards of 1,400 road builders from the United States and Canada, and its success is well known. The citizens of Rochester are very enthusiastic over securing the convention this year, and assurances have been made by road and street officials throughout the state that the eighth annual convention will be, without question, the most successful ever held by the American Road Builders' Association.

Calendar of Meetings

September 18-30.
International Municipal Congress and Exposition. — Chicago, Ill. — Curb M. Treab, Secretary, Great Northern Building, Chicago, Ill.

September 18-October 1.
Fourth International Good Roads Congress.—Chicago, Ill.—J. A. Rountree, Secretary, Birmingham, Ala.

September 19-21.
Association of Edison Illuminating Companies.—Annual Convention, Spring Lake, N. J.—N. T. Wilcox, Secretary, Lowell, Mass.

September 19-22.
International Association of Fire Engineers.—Annual Convention, The Auditorium, Milwaukee, Wis.—James McFall, Secretary, Roanoke, Va.

September 19-22.
American Association of Public Accountants. — Annual Convention, San Francisco, Cal.—T. Cullen Roberts, Secretary, 56 Pine street, New York, N. Y.

September 19-23.
American Hospital Association.—New York City. J. N. E. Brown, M.D., Secretary, Toronto General Hospital, Can.

September 20-22.
Michigan Gas Association.—Annual Meeting, Detroit, Michigan. Glenn R. Chamberlain, Secretary, Grand Rapids Gas Light Company, Grand Rapids, Mich.

September 21-23.
American Electrochemical Society.—Annual Meeting, Toronto, Ont.—Jos. W. Richards, Secretary, Lehigh University, South Bethlehem, Pa.

September 21-23.
American Peat Society.—Annual Meeting, Kalamazoo, Mich.—Julius Bardollo, Secretary, Kingsbridge, N. Y. City.

September 24-30.
International Congress on Tuberculosis.—Rome, Italy.—Professor Ascoli, Secretary-General, Via Lucina, Rome, Italy.

September 25-27.
National Firemen's Association.—Annual Convention, St. Louis, Mo. Capt. Bert Fisher, Secretary, 1252 East Forty-sixth street, Chicago, Ill.

September 25-27.
Illuminating Engineering Society.—Annual Convention, Chicago, Ill.—Preston S. Millar, Secretary, 29 West 39th St., N. Y. City.

September 26-28.
Kansas State Firemen's Association.—Twenty-fourth Annual Convention, Wamego, Kan.—K. D. Doyle, Secretary, Wamego, Kan.

September 26-29.
American Society of Municipal Improvements.—Grand Rapids, Mich.—A. Prescott Folwell, Secretary, 239 West Thirty-ninth street, New York City.

September 27.
Connecticut State Fire Chiefs' Association—Convention, Hartford, Conn.

September 27-28.
Connecticut State Firemen's Association.—Convention, Hartford, Conn.—R. V. Magee, Secretary, Watertown, Conn.

October 4-6.
League of American Municipalities.—Annual Convention, Atlanta, Ga.—John MacVicar, Secretary, Department of Streets, Des Moines, Ia.

October 9-13.
American Electric Railway Association.—Annual Convention, Atlantic City, N. J.—H. C. Donecker, Secretary, 29 W. 39th St., N. Y. City

October 17-19.
American Railway Bridge and Building Association.—Annual Convention, St. Louis, Mo.—C. A. Lichty, Secretary, C. & N. W. Ry., Chicago, Ill.

October 18-20.
American Gas Institute.—Annual Convention, St. Louis, Mo.—A. C. Beadle, Secretary, 29 W. 39th St., N. Y. City.

November 13-16.
National Municipal League.—Annual Meeting, Richmond, Va.—Chilton Rogers Woodruff, Secretary, 705 North American Building, Philadelphia, Pa.

November 20-24.
American Association for Highway Improvement.—First Annual Convention, Richmond, Va.—Logan Waller Page, President, United States Office of Public Roads, Washington, D. C.

PERSONALS

Adams, Edward T., Leesburg, Va., has been elected Mayor.

Burbage, I. J., Cape Charles, Va., has been elected Mayor to fill the unexpired term of Mayor John T. Daniel, resigned.

Crimmins, Thos. E., New York, N. Y., a well-known contractor, engaged in th: work since 1871, died September 8.

Cushing, Eugene B., has been appointed Inspector Public Works at Los Angeles, Cal.

Duke, S. J., has been appointed Chief of the Pearsall, Tex., Fire Department.

Franke, Jay B., Perth Amboy, N. J., has been appointed City Electrician.

Ferber, Henry F., President State Firemen's Association, has been recommended by Governor Tener for membership in State Bureau of Fire Marshals about to be organized.

Garrett, John A., Glen Echo, Md., has been elected Mayor, to succeed Louis Witowski, resigned.

Humphrey, C. W., Chicago, Ill., has been made Consulting and Chief Engineer of Des Moines River Power Co.

Hunt, Clyde C., has been appointed Chief of the Midway, Mass., Fire Department.

Hurst, W. C., Dayton, O., has resigned his position as Superintendent of Toledo division of the Cincinnati, Hamilton & Dayton Ry., to devote his attention to personal interests in California.

Lea, L. D., Lead, S. D., has been appointed City Engineer.

MacFarlan, Reuben, Dr. Sylvester Utter and Arthur Rhodes, Hawthorne, N. J., have been elected Commissioners of the Borough.

McCaleb, J. Sherrick, Mechanicsburg, Pa., has been appointed Highway Auditor by Commissioner Bigelow.

Morrissey, James B., has been appointed division engineer of New York State Highway Department at Rochester.

Murray, Edward, has been appointed Chief of the West Albany, N. Y., Fire Department.

Newcomber, Abraham, has been appointed Chief of the Columbia, Pa., Fire Department.

Noyes, Arthur P., Vallejo, Cal., has been appointed City Engineer.

O'Leary, Henry, has been appointed Chief of the Ripley, Mich., Fire Department.

Parker, Harold, Worcester, Mass., chairman of the Massachusetts State Highway Commission, has sent his resignation to Governor Foss to take effect Nov. 1. It is reported that he has been made vice-president of the Hassam Paving Co. and will have charge of that company's contracts in this country and Canada.

Poe, Edgar Allan, Baltimore, Md., Democratic nominee for Attorney-General, has sent in his resignation as City Solicitor.

Porter, Frank, has been appointed Chief of the Cameron, Tex., Fire Department.

Shaw, James B., has been appointed Chief of the Verona, Pa., Fire Department.

Stamberger, J. H., East Cleveland, O., has been elected secretary-treasurer of Ohio Police Chiefs' Association.

Ringer, F., Parsons, Kans., has been made Assistant Chief Engineer, with headquarters at St. Louis, Mo.

Wilson, J. A., New York, N. Y., has been reinstated as Chief Marine Engineer in Department of Docks and Ferries by Commissioner Tomkins.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago: Miscellaneous business has held up well and the demand for 4-inch pipe exceeds the supply. Quotations: 4-inch, $26.50; 6 to 12-inch, $24.50; 16-inch and up, $24. Birmingham: Shipments from local plants have been heavy. The percentage of active capacity has not yet been increased, but repairs to the plant formerly operated by the Dimmick Pipe Company are well under way. Prices are well maintained. Quotations: 4 to 6-inch, $23; 8 to 12-inch, $22; over 12-inch, $21. New York: Many of the inquiries recently in the market have failed to result in sales. Quotations: 6-inch, car loads, $21 to $22.

Lead.—Lead is weaker in the West and outside dealers who have been in control of the market there have reduced their quotations to 4.40c. They continue to quote higher than the American Smelting & Refining Company in this market and the New York price is unchanged at 4.50c., which is the quotation made by the leading interest.

Rubber Tires.—Carrying out a plan of establishing factory representation in all parts of the country the United States Tire Company will this fall open many new branches through which the products of its five immense rubber plants will be distributed. Branches have recently been opened in Los Angeles, Fresno, Portland, Seattle, Salt Lake and Denver. San Francisco is the pivotal point of this western district and a new building is being erected there for the occupancy of the tire company. In addition to the branches numerous agencies also have been appointed which will be served from the nearest point of distribution.

Rubber Tires.—Greater freedom from tire trouble and consequent tire economy will be the immediate outgrowth of the tendency of automobile manufacturers to increase the size of wheels, according to R. R. Drake, manager of the service department of the United States Tire Company.

Mr. Drake's business for several years has been to study tire ills and conditions which bring them about and he, as well as everyone else who has given thought to the subject, knows that overloading is one of the chief causes of tire trouble. Therefore the increase of wheel diameter noticed in the 1912 specifications of some of the best known cars is regarded by him as a good thing for the purchaser. There is absolutely no economy in buying tires of small size for a car expected to carry a heavy load. Motorists are gradually awakening to the fact that a little extra money spent for larger size tire proves a mighty good investment in the long run.

Underground Construction.—The Underground Construction Company, St. Louis, Mo., is sending out a circular letter announcing that the company is prepared to execute contracts for underground construction of any magnitude or description. It is stated that the company is governed by an advisory board composed of engineers of national reputation.

Municipal Testing Plant.—The St. Louis Board of Public Improvements has decided to install in the municipal testing plant a new machine capable of crushing the hardest of rock and brick for use in testing street materials.

Refuse Destructors.—The Heenan High Temperature Destructor which was built for the City of Montgomery, Ala., by the Destructor Company, Power Specialty Company, Mgr., has been in operation for several months, fulfilling all guarantees and is said to be giving highly satisfactory results. The following Canadian cities have placed contracts for Heenan Destructors:

Calgary—One plant of 75 tons capacity per 24 hours.

Moosejaw—One plant of 55 tons capacity per 24 hours.

Both of these plants have been arranged so that they can be duplicated whenever necessity for extension arises.

Automatic Register of Passengers.—The Automatic Register Company, East St. Louis, Ill., has had its machine tested on the Illinois Traction System. The device not only records the number of passengers who enter the car or train, but the mileage traveled by each. It is stated that no attention from the passenger or conductor is required in working the device. The company has an authorized capital stock of $1,000,000. A. D. Branham, the inventor, is president of the company; Judge William P. Launtz, first vice-president and general counsel; Adolph R. Korreck, second vice-president; Paul W. Abt, secretary and treasurer; Ernest Lane, general manager; Gebhard A. Buettner, superintendent.

New Oil Engine.—A two-cycle single-cylinder oil engine of 65-horsepower capacity is shortly to be brought out by the Remington Oil Engine Company, Stamford, Conn. It is to follow the design of other Remington oil engines, and is intended for electric lighting units, having close speed regulation. Its normal speed is 225 revolutions per minute.

Iron Pipe and Culverts.—The Colorado Ingot Iron Pipe & Culvert Company, Colorado Springs, Col., has secured a new plant location and will erect a steel factory building in which new machinery will be installed. This company is associated with the American Rolling Mill Company, Middletown, Ohio.

Steam Pumps.—The Buffalo Steam Pump Company, Buffalo, N. Y., has purchased property adjoining its present plant at North Tonawanda, N. Y., on which are buildings giving the company an additional floor space of about 35,000 square feet. Later other buildings will be erected.

Electric Company.—The Adams-Bagnall-Bagnall Electric Company, Cleveland, O., has commenced the erection of a modern factory building on its present site. A six-story structure of brick, steel and cement construction is being erected that will provide 65,000 square feet of floor space. The company does not expect to need any new machinery equipment.

Motor Truck.—The motor truck recently purchased by the St. Johns County Commissioners for use in the construction of shell roads near St. Augustine, Fla., is reported to be doing excellent work. The truck at first handled 30 barrels of shells to a load and later this number was increased to 40. Owing to the use of the truck the work is progressing much faster than usual.

Vitrified Clay vs. Cement Sewer Pipe.—A serious typographical error occurred in an advertisement in the MUNICIPAL JOURNAL, September 13, page 29. The Clay Products Publicity Bureau, Kansas City, Mo., called attention to the disappointing results, so far as promised saving in money was concerned, by the substitution of cement for clay pipes on certain work in that city. The saving was only 3.8 per cent, not 38 per cent as the text read. The statement corrected is as follows:

"On 20 sewer contracts executed in Kansas City the City Engineer gives $196,602 as the total cost; $37,508 of this was for sewer pipe—19 per cent. The promised saving of 20 per cent on the pipe item offered by prospective concrete pipe manufacturers amounts then but to 3.8 per cent of the total tax bill. At the engineer's estimate of 2¾ cents a front foot each taxpayer having a 25-foot lot would save just 69½ cents."

This calculation shows how little, in many instances, the cost of the material purchased figures in the total value of the improvement.

Combination Hose and Chemical Wagons.—The Seagrave Company, of Columbus, Ohio, have just received another contract from the city of Birmingham, Ala., for motor propelled fire department apparatus. This last contract consists of six combination hose wagons and chemical engines. These machines will be equipped with 6-cylinder, 80-hp. blower cooled Seagrave motors, the motors to have a bore of 5¾ inches and a stroke of 6 inches. The hose bodies on the apparatus will carry 2000 feet of regulation 2½-inch fire hose and they will also be fitted with a 40-gallon copper Seagrave chemical engine, as well as carrying the usual equipment of axes, crowbars, lanterns, ladders, etc. This last order for apparatus is going to be used in the downtown districts of Birmingham, Ala., where the fire service is very heavy. Another feature about this apparatus is that the rear end of the frame will be fitted with an attachment which will take a pole, to which the first size steam fire engine will be attached.

Sanitation Works in Japan.—Before the opening of the World Exposition to be held in Tokyo in commemoration of the 50th anniversary of the crowning of the Mikado, the Japanese authorities have decided to install a complete system of modern sanitary sewerage, modeled after that of modern Western cities. As the area of Tokyo is one of the largest of the cities in the world, such a complete scheme of sewerage would require many thousand feet of sewer pipe. The mayor of Tokyo, Y. Ozaki, informs me that approximately $17,000,000 to $20,000,000 will be spent in this inprovement, and that the Tokyo system will be composite in nature, embodying the most suitable features of many cities. It is probable that the Tokyo system, however, will resemble the Berlin sewerage system in many essential features.

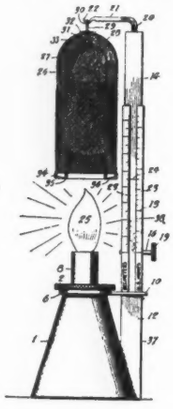
The proper authorities to address regarding the introduction of articles for the sanitation enterprise are K. Inuzuka, Chief of the Bureau of Public Works, Home Department, Tokyo, and the Department of Public Works, City Office, Tokyo.

Before attempting to introduce American products into Japan suitable for sanitation of cities, patents should be properly registered according to Japanese law. The Chief of the Patent Bureau at Tokyo will furnish all desired information in this respect.

PATENT CLAIMS

1,002,717. SMOKE-METER. Frederick W. Mann, Franklin, Pa. Serial No. 620,598.

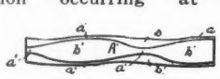
A device of the character specified, comprising a reservoir for the fuel, a burner for the reservoir, a standard comprising a plurality of sections, one of the sections being tubular and being secured to the reservoir and provided with oppositely arranged longitudinal slots, the section having a scale adjacent to each slot, the other section being slidable in the first-named section and having an indicator co-operating with each scale, said section having a longitudinal rib on its rear face extending



through the adjacent slot and provided with rack teeth, the first-named section being provided with bearings near the reservoir, a shaft journaled in the bearings, a pinion on the shaft meshing with the rack teeth, said last-named section having a lateral arm provided with a hook, and means for collecting the unconsumed carbon said means being supported by the hook, and comprising a plurality of concentric shells of perforate material, each shell being open at its lower end and closed at its upper end and spaced apart from the other shell, and a ring substantially U-shaped in cross section connected with the lower edge of each shell, the inner ring having radial arms for engaging the outer ring to space the rings apart.

1,002,565. REINFORCING-BAR FOR CONCRETE AND SIMILAR STRUCTURES. William C. Coryell, Youngstown, Ohio. Serial No. 445,298.

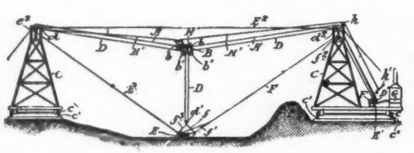
A concrete reinforcing bar having its exterior composed wholly of undulating faces extending each throughout the length of the bar and having cross sections of like configuration occurring at intervals



throughout the length of the bar and having the figure of each section rotated in its plane about the axis of the bar relative to the next like section and portions between said sections having cross sections of continuously varying configuration.

1,002,732. EXCAVATING SYSTEM. Charles A. Morris, Montclair, N. J. Serial No. 564,076.

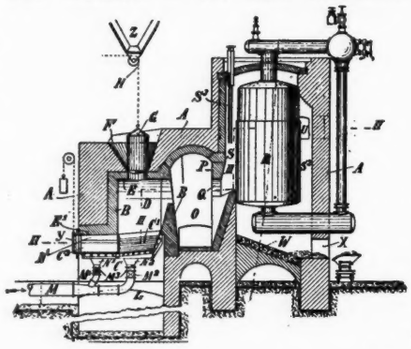
In an excavating system, a track, a carriage adapted to travel thereon, a fall rope adapted to be held out of vertical alinement during the travel of the carriage, a shovel suspended by the fall rope from said carriage, and a haul rope attached to the



shovel for loading the same, for exerting a pull on the shovel without imparting movement to the carriage (whereby the said shovel is thrown out of vertical alinement with the carriage), and for imparting movement to said carriage and shovel while thus out of vertical alinement.

1,002,575. FURNACE FOR BURNING REFUSE. Johann Aloys Fried, Barmen, Germany, assignor, by mesne assignments, of two-thirds to Max Bouchsein, New York, N. Y. Serial No. 478,949.

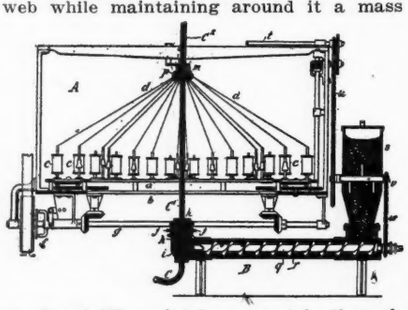
A refuse burning furnace having a main combustion chamber provided with an extension, a main grate in said chamber, a foregrate forming a continuation or extension of the main grate and located in the said extension of the main combustion



chamber, the foregrate being arranged to receive the slagged material from the main grate, and means for supplying air to the foregrate, the two grates being so arranged that the heated air from the foregrate will enter the main combustion chamber above the fuel bed therein and mingle with the gases of combustion therein; substantially as described.

1,002,644. MANUFACTURE OF RUBBER HOSE. Henry Zenas Cobb, Winchester, Mass., assignor to Revere Rubber Company, Boston, Mass., a Corporation of Rhode Island. Serial No. 610,670.

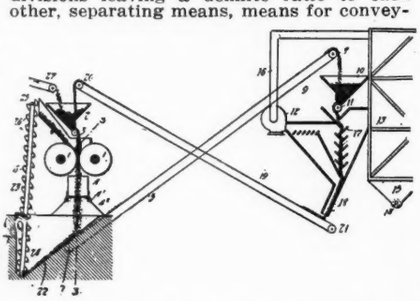
The process of making hose or the like, which consists in forming a tubular textile web while maintaining around it a mass



of dough-like plastic material through which the yarns pass on their way to form the web, whereby the yarns are impregnated and the web is coated with such material.

1,002,504. CRUSHING AND SEPARATING FINE MATERIALS. Thomas A. Edison, Llewellyn Park, West Orange, N. J. Serial No. 476,488.

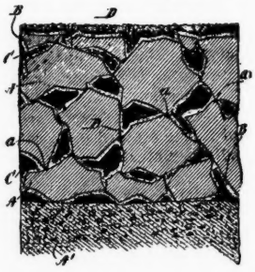
In separating and crushing apparatus, in combination, crushing means, feeding means for the same, means for dividing the crushed material indiscriminately into two divisions leaving a definite ratio to each other, separating means, means for convey-



ing one division of the crushed material to the separating means, means for conveying the tailings from the separating means back to the feed for the crushing means, and means for conveying the other division of the crushed material back to the feed for the crushing means, substantially as described.

1,001,695. PAVEMENT. August E. Schutte, Newton, Mass. Serial No. 586,828.

A pavement for foot or vehicular traffic, consisting of a layer composed of stone coated and cemented together with rela-



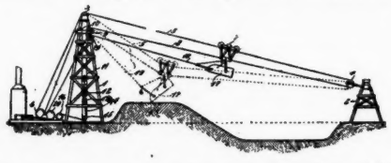
tively pure Portland cement grout, the voids between the stones so coated being filled with bituminous cement.

1,002,603. PURIFICATION OF WATER. Ernest Edward Munro Payne, Leicester, England, assignor of one-half to William Henry Staynes, Leicester, England. Serial No. 511,166.

The herein described method of treating water, which consists in adding thereto a caustic alkali in a sufficient quantity to combine with the carbonic acid and acid carbonates contained in the water, and also adding tri-sodium phosphate, thereby forming normal phosphates of the metals held in solution in the water and causing their precipitation.

1,002,545. CABLEWAY EXCAVATING SYSTEM. Charles L. Wachter, New York, N. Y., assignor to Lidgerwood Manufacturing Company, New York, N. Y., a Corporation of New York. Serial No. 601,528.

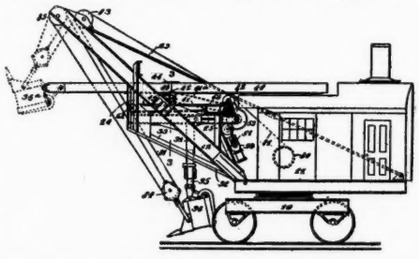
In an excavating cableway, elevated supports, a main cable passing over said supports, a carriage on the cable, said cable being reversed upon itself and connected to the carriage, a hauling line connected to



the carriage, means for operating the cable and hauling line to traverse the carriage, an excavating bucket suspended from the carriage, a loop in one of the bucket traversing lines, and means for taking in and letting out said loop to regulate the elevation of the bucket.

1,002,685. EXCAVATING MECHANISM. Hollis M. Harris, Lorain, Ohio, assignor to The Thew Automatic Shovel Company, Lorain, Ohio, a Corporation of Ohio. Serial No. 616,254.

In an apparatus of the class described, the combination of a dipper or scoop, two



interchangeable handles therefor, and mechanism for raising and lowering one handle and for shifting in and out the other handle.

1,002,241. SYSTEM IN WATERFALL-POWER UTILIZATION. Albert F. Eells, Rochester, N. Y. Serial No. 637,739.

A system of water fall power utilization including in combination a chambered carriage carrying a water wheel installed behind the water fall and mounted for movement toward and away from the descending water.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards.

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO.
			STREET IMPROVEMENTS	
Ohio	Hartford	Sept. 22	Paving approximately 4,000 sq. yds. bituminous concrete 8,600 sq. yds. macadam with oil binder, 1,400 ft. 10 and 12-in. sanitary sewer, manhole, etc.	Geo. B. Grandstaff, Village Clerk.
Ohio	Cincinnati	Sept. 22, noon	Improving road	Stanley Struble, Pres. Co. Comrs.
Iowa	Cedar Rapids	Sept. 22	Constructing concrete paving	L. J. Storey, City Clerk.
Indiana	Evansville	Sept. 23, 10 a.m.	Grading, curbing, guttering and paving several streets	Board Public Works.
Ohio	Mt. Vernon	Sept. 25, 1 p.m.	Grading and macadam. .60 miles road in Hilliar twp. cost, $4,920	Highway Commissioners.
Minnesota	Ada	Sept. 25, 4 p.m.	Constructing cement walks	County Board.
Minnesota	Minneapolis	Sept. 25, 11 a.m.	Grading and graveling 2 roads	A. P. Erickson, County Auditor.
Ohio	Cincinnati	Sept. 25, noon	Improving road	Fred Dreihs, County Clerk.
Nebraska	Hastings	Sept. 25	Paving alley with asphaltic concrete	City Clerk.
Ohio	Sandusky	Sept. 25, 1:30 p.m.	Furnishing 29,825 gals. bituminous material and 2,826 tons crushed stone for the improvement of 6,300 ft. of Milan Road	County Commissioners.
Ohio	Medina	Sept. 26, 1 p.m.	Grading and macadamizing 1.00 miles road in Medina and Brunswick townships, cost, $9,525	Highway Commissioners.
Ohio	Toledo	Sept. 26, noon	Paving with vitrified brick on concrete foundation	Director Public Service.
Oklahoma	Muskogee	Sept. 26, 10 a.m.	Paving several streets	City Clerk.
New York	Albany	Sept. 26	Widening street, cost $10,000	Board Contract & Supply.
Maryland	Frostburg	Sept. 28, 2 p.m.	Constructing 2,000 lin. ft. pavement	J. J. Price, Chm. Street Com.
North Carolina	Burlington	Sept. 28, 3 p.m.	Constr. 20,000 yds. bituminous macadam, penetration method; 15,000 yds. concrete sidewalk, 5,000 ft. concrete curb and gut.	J. H. Freeland, Mayor.
Ohio	Cleveland	Sept. 28	Grad, curb., drain. and pav. with brick several streets	A. B. Lea, Dir. Pub. Service.
Illinois	Catlin	Sept. 29	Constr. vitrified brick pavement, cost $35,000	Dr. O. Allison, Chm. Bd. Loc. Imp.
Ohio	Cincinnati	Sept. 29, noon	Improvement several streets	Fred Dreihs, Clerk.
Indiana	Greencastle	Sept. 30	Improving 2,005 ft. macadam road in Putnam County	D. V. Moffett, County Auditor.
Texas	Galveston	Oct. 1, 11 a.m.	Paving with vitrified brick about 4,900 sq. yds.	John M. Murch, County Auditor.
New Jersey	Elizabeth	Oct. 2, 8:30 p.m.	Constr. 1,340 lin. ft. new curb, 9 lin. ft. new corners 1,121 cu. yds. excavation to be used for filling where necessary	N. K. Thompson, St. Comr.
Washington	Spokane	Oct. 3, 2 p.m.	Improving by grading, curbing, parking and sidewalking on Lacrosse Ave	C. A. Fleming, City Clerk.
Indiana	Vincennes	Oct. 3, 2 p.m.	Constructing sidewalk on Busseron Street	John T. Scott, County Auditor.
Florida	Palatka	Oct. 3	Paving 15,000 sq. yds. with brick and 4.8 miles with shell or gravel setting 18,000 ft. curbing	City Council.
Alabama	Oneonta	Oct. 3	Grad., drain. and surfacing with chert 1 mile State Aid Road	Board Commissioners.
Indiana	Logansport	Oct. 3	Constructing 2 gravel and 1 macadam road	J. E. Wallace, County Auditor.
Indiana	Bedford	Oct 3,	Constructing 13 gravel or macadam roads	E. W. Edwards, County Auditor.
Alabama	Anniston	Oct. 4, noon	Grading, draining and surfacing with chert or macadam 3 miles of State Aid Road	W. S. Keller, State Hwy. Engr.
W. Virginia	Huntington	Oct. 5, 1 p.m.	Paving several streets with No. 1 vitrified brick	John Coon, Commissioner Streets.
Ohio	Cleveland	Oct. 7, 11 a.m.	Grading and improving road	J. F. Goldenbogen, Clk. Co. Coms.
Ohio	Chagrin Falls	Oct. 7	Grad., drain. and improv. Fenkel & Solon Road in Chagrin Falls	County Commissioners.
North Carolina	Raleigh	Oct. 9, 11 a.m.	Constructing concrete walks at National Cemetery	H. L. Pettus, Major & Q. M., U. S. A. Washington, D. C.
Indiana	Bluffton	Oct. 10, 10 a.m.	Constr. gravel road on County line between Allen and Wells Counties	Board of Commissioners.
Brazil	Rio Grande	Nov. 12	Constructing paving, drainage system and water works	Mayor.
			SEWERAGE	
California	Oakland	Sept. 22, 11 a.m.	Constructing sewers and appurtenances	Frank R. Thompson, City Clerk.
Minnesota	Pipestone	Sept. 25, 8 p.m.	Constructing covered tile ditch 7,700 ft. in length, averaging 5 ft. in depth; said tile to be 12 in. and made of cement of Mason City (Ia.) clay	S. W. Funk, City Clerk.
South Carolina	Rock Hill	Sept. 25	Constructing 3 sewage disposal plants	J. B. Johnson, Chm. Sewerage Com.
Alabama	Auburn	Sept. 25, 8 p.m.	Constructing 2,750 ft. 8-in., 4,650 ft. 6-in. sewers	R. W. Burton, Town Clerk.
Iowa	Fairfield	Sept. 25	Constructing sewer system	J. P. Starr, Mayor.
Oklahoma	Muskogee	Sept. 26, 10 a.m.	Constr. 8-in. sewers in 2 districts	Chas. Wheeler, Jr., City Clerk.
Kentucky	Louisville	Sept. 26, 2 p.m.	Constr. 54-in. concrete sewer and a 30-in. vitrified pipe sewer	R. G. McGrath, Secy. Bd. Pub. Wks.
Ohio	Toledo	Sept. 27, noon	Constructing main sewer No. 1119	Director Public Service.
Illinois	Bushnell	Sept. 30, 7:30 p.m.	Constructing 5 blocks of sewers	C. L. Harrah, City Clerk.
New Jersey	Elizabeth	Oct. 2, 8:30 p.m.	Constr. sewer in Amity St. also 230 lin. ft. 10-in. pipe sewer, 140 lin. ft. 6-in. pipe to curb, 2 manholes plastered on outside with ½ cement mortar	N. K. Thompson, Street Comr.
Iowa	Mason City	Oct. 2	Constructing sewage disposal plant	J. H. McEwen, City Clerk.
Washington	Spokane	Oct. 3, 2 p.m.	Improving First Ward sub-trunk sewer	C. A. Fleming, City Clerk.
New York	Newburgh	Oct. 3	Constructing 18-in. sewer	City Council.
South Dakota	Madison	Oct. 5	Constructing sewage disposal plant	Wm. Rae, City Auditor.
Virginia	Colonial Beach	Oct. 11, noon	Constr. 3 miles 8 to 15-in. sewers, 3 miles 4 to 8-in. water mains, sewage disposal plant, sewage lifts, power house, water tower and artesian well	H. W. B. Williams, Mayor.
			WATER SUPPLY	
North Dakota	Grand Forks	Sept. 22, 5 p.m.	Constructing water mains	C. J. Evanson, City Auditor.
Kansas	Lawrence	Sept. 23, noon	Constr. 2 cisterns 12 ft. in diameter by 14 ft. in depth; 1 at County Farm, 1 in Grant township	W. R. Green, County Clerk.
Iowa	Fairfield	Sept. 25, 7 p.m.	Constr. filter tanks, coagulating tanks, settling tank pumps, blower, washing devices, pipe fittings, etc., capacity 1,000,000 gals. per day	C. E. Ward, Chm. Water Com.
Oklahoma	Hayleyville	Sept. 25, 4:30 p.m.	Furn. cast iron pipe; triplex pump, motor, etc	Town Clerk.
New York	New York	Sept. 26, 11 a.m.	Constr. contract 100; extension of Croton blow off; Contract 113 test pits Silver Lake Reservoir; Contract 103, Queens conduit	Board Water Supply.
Montana	Terry	Sept. 26	Constructing 3 concrete cisterns	Ray L. Kampf, Town Clerk.
Indiana	Lafayette	Sept. 28	Constr. reinforced concrete reservoir, 75 ft. diameter 10 ft. deep	City Clerk.
Colorado	Ft. Logan	Sept. 28	Furnishing pipe fittings	Capt. P. T. Frisell, Quartermaster.
Ohio	Jefferson	Sept. 29	Enlarging dam	J. J. Neave, Clerk Trustees Pub. Afrs.
Ohio	Toledo	Sept. 29, noon	Constructing reservoir 15,000,000 gal. capacity	J. R. Cowell, Dir. Pub. Service.
Canada	Montreal, Que.	Oct. 3, noon	Constr. prefilters, filtered water reservoir and appurtenances	Board Commissioners.
New York	New York	Oct. 4, 2 p.m.	Furnishing material and labor for alterations, repairs and improvements at various pumping stations in boro. of B'klyn	Department Water Supply, 13 Park Row, Manhattan.
Australia	Queensl'd, Brisb.	Jan. 30, noon	Furnishing a 6 million gallon pumping plant of 2 or 3 units	G. R. Johnston, Secy. Board, Albert St., Brisbane, Queensland.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO.
BRIDGES				
Ohio	Cincinnati	Sept. 22, noon	Constructing concrete bridge	County Commissioners.
New York	Phoenix	Sept. 22, 2 p.m.	Constr. piers, abutments and substructures of reinforced concrete bridge to be built across Oswego River	Town Clerk.
Illinois	Belleville	Sept. 23, 3 p.m.	Constructing abutments for bridge	Drainage Commission.
Mississippi	Vicksburg	Sept. 23, noon	Repairing brick arch of present bridge and bldg. reinforced concrete extensions on east and west sides	A. M. Paxton, City Clerk.
Pennsylvania	Clearfield	Sept. 23	Constructing reinforced concrete bridge, two 53-ft. spans	E. W. Hess, Engineer.
Massachusetts	Fitchburg	Sept. 25, 5 p.m.	Constructing viaduct on Fifth Street	Board Street Commissioners.
South Carolina	Edgefield	Sept. 25, noon	Constr. bridge one steel span, 125 ft. long, with roadway 12 ft. in the clear and wooden trestle approaches 210 ft. on East side and 105 on West	Board Commissioners.
Oklahoma	Newkirk	Sept. 25	Erecting steel bridge across Chicaskia River; 3 spans: one 120 ft. and two 80 ft. each	County Commissioners.
Indiana	Indianapolis	Sept. 26, 10 a.m.	Constructing several culverts and bridges	Board Commissioners.
Idaho	Burley	Sept. 28	Constructing steel pile highway bridge	Bridge Commission.
Texas	Galveston	Oct. 1, 11 a.m.	Paving with vitrified brick or block portion of causeway known as arch bridge	John M. Murch, County Auditor.
North Carolina	Hendersonville	Oct. 2	Constructing 2 steel bridges	County Commissioners.
Georgia	Cartersville	Oct. 4	Constr. 40 ft. reinforced concrete bridge	G. A. Veach, Chm. County Com.
Louisiana	Natchitoches	Oct. 4	Constructing bridge across Cane River	Police Jury Committee.
Louisiana	Bermuda	Oct. 4	Constructing steel highway bridge	Police Jury.
West Virginia	Huntington	Oct. 6, noon	Constructing superstructure of bridge	County Clerk.
Ohio	Cleveland	Oct. 7, 11 a.m.	Constructing bridge work	J. F. Goldenbogen, County Clerk
LIGHTING AND POWER				
Florida	Pensacola	Sept. 26	Furnishing electric fixtures for new county jail	County Commissioners.
Florida	Pensacola	Sept. 26, 10 a.m.	Installing gas and electric fixtures in court house	James MacGibbon, County Clerk.
Dist. of Col.	Washington	Oct. 9, 10:30 a.m.	Furn. machinery for hydro-electric station at Gatun	Major F. C. Boggs, Purchasing Agt.
Montana	Butte	Oct. 12	Furnishing lighting fixtures for court house	County Commissioners.
South Carolina	Charleston	Oct, 18, noon,	Lighting streets for term of 1, 2 or 4 years; electricity gas or other means	I'on Simons, City Electrician.
California	Los Angeles	Oct. 20	Equipp. San Franciscquito Power house, capacity 30,000 h.p.	E. F. Scattergood, Chief Engineer.
Australia	Brisbane	Jan. 30, noon	Designs, supply and erection at Mount Crosby Pumping Station of alternatively one, two and three complete units consisting of power generating pumps and plants, etc	Geo. Johnston, Albert St., S.&W.Bd
MISCELLANEOUS				
Ohio	Cleveland	Sept. 25, noon	Building 3 shelter houses	A. B. Lea, Dir. Pub. Service.
Massachusetts	New Bedford	Sept. 25, 9 a.m.	Constructing steel fence	S. P. Richmond, Chm. Park Board.
Manitoba, Can.	Winnipeg	Sept. 25, 11 a.m.	Furn. 2 motor hose wagons, 1 aerial truck and 30 fire boxes	Board Control.
New York	Herkimer	Sept. 26	Improving channels of West Canada Creek and Mohawk River	Department Public Works.
California	Los Angeles	Oct. 1	Furnishing machinery for electrical equipment, cost $350,000	Public Service Com.
New Jersey	Jersey City	Oct. 2, 2 p.m.	Removing garbage, 2 propositions; 1, removal of ashes, garbage, and kitchen refuse without separation; 2, removing same as above, separately	E. B. See, Clerk Board Comrs.
West Virginia	Wheeling	Oct. 12	Constructing power house and equipment	Major F. W. Altstetter, Qu'master.
Brazil	Pelotas	Nov. 14	Constructing, tramway electric light and power system	Mayor.

STREET IMPROVEMENTS

Alabama City, Ala.—Council has decided to improve Kyle ave. and Forest ave.

Cullman, Ala.—City is considering bond issue of $400,000 for improvement of Cullman County roads.

Girard, Ala.—City Council has decided to grade and park Broad st. Bids will be advertised for sand and gravel work.

San Leandro, Cal.—Members of Board of Trustees are making preparations for submitting to people bond issue of $20,000 for repairing of streets.

Washington, D. C.—Plans have been approved of for resurfacing roadway of O st. between 21st and 22d sts.

Bartow, Fla.—Election will be held Oct. 10 for voting on question of bonding county for $500,000 for purpose of building hard roads.

Jacksonville, Fla.—Cutting of right-of-way and grading same for roadway from point at or near East Mayport to ocean jetties has been ordered, same to be paid from proceeds derived from $1,000,000 bond issue.

Palatka, Fla.—City Council has ordered 7 miles more of paving on city streets.

Moline, Ill.—Council has authorized Board of Local Improvements to proceed with project for paving 7th st. from Summit to Keokuk aves.; estimated cost, $21,678.

Indianapolis, Ind.—Following streets will be improved: Capitol st., with asphalt resurface; 15th st., with improved roadway; Washington st., north side, with cement walks; College st., east side, with walks and curb; Ashland st., with walks and curb; 15th st., with walks and curb; Pratt st., with cement walks.

Liberty, Ind.—Taxpayers have decided to build 3¼-mile gravel road to connect with Chesterton; estimated cost, $18,000.

Vincennes, Ind.—Petitions are being received by County Commissioners asking for construction of more gravel roads.

Cedar Rapids, Ia.—Petition is being circulated for paving of 5th ave. West from 1st to 6th st.

Louisville, Ky.—Improvements to various streets have been decided on.

Vine Grove, Ky.—Town will construct macadam road to Big Spring, distance of 10 miles.

Lowell, Mass.—Following resolutions have been passed: To change and re-establish grade of Knapp ave.; to lay sidewalk of edgestones and cinders, or gravel, from southerly side of West Bowers st. from Wannalancit st. easterly 64 ft.; to lay sidewalk on Beaver st.; to lay sidewalk on Riverside st.

Lynn, Mass.—Construction of 50-ft. road from Great Woods rd. to Wyoma sq. is being considered.

Virginia, Minn.—Resolution has been passed providing for paving of Ohio ave. with bitulithic paving between Spruce and Poplar sts. and Lake blvd. with creosote blocks between Walnut st. and Central ave.

Columbia, Mo.—Columbia Road District has voted to issue $100,000 in bonds for building good roads along cross-state highway.

Omaha, Neb.—Resolutions have been passed authorizing opening and widening of streets, and other street improvements.

Collingswood, N. J.—Citizens will vote on Sept. 21 for or against bonding borough for $50,000 for street improvements and purchase of street roller.

Elizabeth, N. J.—Plans have been prepared for paving Elizabeth ave., and Broad, East Jersey and 1st sts., at a cost of $884,875.

Jersey City, N. J.—Street and Water Board will consider cost of widening Montgomery st.

Salem, N. J.—Salem County Board of Freeholders has been petitioned to make Garden rd., Pittsgrove township, a State road, using gravel for surface.

Woodstown, N. J.—Salem County Trust Co. has been awarded entire $10,000 issue of Woodstown street improvement bonds.

Babylon, L. I., N. Y.—Election will be held Sept. 26 for voting on appropriation of $39,500 for improvements to Main st. and to Railroad ave.

Buffalo, N. Y.—City Council has ordered paving of following: Weyand st., brick, to Frank ave.; Monroe st., asphalt, between Brown and Genesee sts.; Warren ave., asphalt, between Broadway and Kent st.; Krupp st., asphalt, from Ashley st. to end of street; Austin st., asphalt, from Military rd. to New York Central R. R. Viaduct.

Buffalo, N. Y.—Paving and widening of Grant st. has been approved of.

Buffalo, N. Y.—City will probably repave Oak st. between Genesee and Goodell sts., Huron st. between Main st. and Delaware ave., and Timon st. between Main st. and Delaware ave.

Troy, N. Y.—Oakwood ave. will be widened, at cost of $10,000.

Cincinnati, O.—Ordinances have been passed for resurfacing Philadelphia st. from 4th to 7th st. with asphalt paving.

Terrace Park, O.—Milford National Bank has been awarded $1,300 street improvement bonds.

Pawhuska, Okla.—Voters have authorized $50,000 bond issue for purpose of improving roads.

Altoona, Pa.—State Highway Commissioners are considering building Buckhorn rd. by way of Altoona and Chest Springs.

Chester, Pa.—Paving of Edgmont ave. from 3d st. to 12th st. with filbertine has been decided.

Franklin, Pa.—Council is considering paving of 13th st. from Lake Shore tracks to French Creek bridge.

So. Bethlehem, Pa.—City Council has decided on 5 miles of brick paving of streets and alleys.

Providence, R. I.—Plans for widening three principal downtown streets are under consideration.

Park City, Tenn.—Extensive street improvements have been planned and contracts will shortly be awarded.

Abilene, Tex.—City Commissioners have rejected paving bids as being too high. Other bids will be called for.

Bridgeport, Tex.—Bond issue of $14,000 has been voted for street improvements.

El Paso, Tex.—Resolution has been adopted for paving of Mundy ave.

Pecos, Tex.—City Council has ordered cement sidewalks on Oak st. as far as court house.

Tilden, Tex.—Citizens have voted in favor of issuance of $35,000 bonds for improving of roads in McMullen County.

Lynchburg, Va.—Committee on Streets is planning street improvements and will recommend $650,000 bond issue for constructing reinforced concrete bridge over James River.

Walla Walla, Wash.—County Commissioners have decided to improve Seebe rd. from Division st., distance of 10,000 ft.

Toronto, Ont.—Civic Committee on Works has decided to extend Victoria st. at cost of $315,000.

CONTRACTS AWARDED

Los Angeles, Cal.—For grading and putting in culverts on two sections of San Fernando rd., to F. F. Prendergast, at $43,342.

San Jose, Cal.—By Board of Supervisors, for repairing Oldham, Holsclaw and Leavesly rds., to Casley & Henwood, at $5,001.

Jacksonville, Fla.—By City, for paving Bay st. from Bridge to Market sts., to Engineering & Paving Co., at $1,200.

Jacksonville, Fla.—For paving Duval County road from end of present school road to Duval station with clay macadam gravel, to Mattier & Young, at 71c. per. sq. yd. Other bids were: George R. Foster, 82c. per sq. yd., and J. J. Logan Concrete Co., at $1.02½ per sq. yd.

Mayo, Fla.—By County Commissioners, for clearing and opening up 30-ft. right-of-way for public hard-surfaced road from Suwannee River bridge near Luraville, to C. T. Burnett.

Fredonia, Kan.—By Council for paving, to McGuire & Stanton Contracting Co., at $40,000.

Rockland, Me.—For widening and paving Sea st., to D. F. Griffin & Bro., Portland, at $19,024. Other bids as follows: Harrison & Burton, New York City, $19,100; Coleman Bros., Boston, Mass., $19,430; John Gullian, Portland, $21,940; Booth Bros., Hurricane Island, $29,500.

Boston, Mass.—For constructing artificial stone sidewalks in Thetford ave., Dorchester, to Adams Pond Co., at $5,058. Other bids were: James Doherty, $5,250; Warren Bros. Co., $5,318; John T. Shea, Jr., $5,430; Wm. J. Rafferty Co., $5,693; Jeremiah J. Sullivan, $5,703; D. E. Lynch, $6,408.

Boston, Mass.—For constructing tar macadam roadway in Bay st., Dorchester, to F. S. & A. D. Gore, at $7,355. Other bids were: James Doherty, $7,538; Wm. J. Rafferty Co., $7,705; D. E. Lynch, $9,161.

Malden, Mass.—By City, for construction of granolithic sidewalks on Pleasant st., to Florence st., to Warren Bros. Co., 6-in. base, $1.33 per sq. yd., and 12-in. base, $1.60 per sq. yd. Other bids as follows: C. W. Dolloff Co., 6-in. base, $1.50; base, $1.53; Joseph Ufheil & Co., 6-in. base, $1.44; 12-in. base, $1.53; W. A. Murtfeldt Co., 6-in. base, $1.38; 12-in. base, $1.48½.

Worcester, Mass.—For paving Pleasant st. from Newton Square to Lenox st., to Hassam Paving Co., at $26,140. Other bidder was George W. Carr Co., $26,524.

Ely, Minn.—By City, for construction of combined curbs, gutters, storm sewers and building of cement sidewalks, to Eveleth Construction Co., at $15,118.88.

Carthage, Mo.—By City Council, for improvement of Main st. from 5th st. to Centennial ave., to L. W. Winter, of Winter Construction Co., of Joplin, at $1,729.

St. Joseph, Mo.—For paving Messanic st. between 5th and 6th sts., with sandstone blocks, to Metropolitan Paving Co., at $2.88 per sq. yd. Other bids as follows: Land Construction Co., at $2.98; Henry Reinert, at $3.35, and Young Bros., at $3.19.

Jersey City, N. J.—For improvement of Garrison ave., from DeKalb to Stuyvesant ave., to Barber Asphalt Paving Co.

Westfield, N. J.—By Council, for macadamizing Edgewood ave., Dudley ave. and 1st st., to Weldon Contracting Co., at $7,323.

West New York, N. J.—For constructing 5,000 sq. yds. of asphalt block pavement to Hastings Pavement Co., 25 Broad st., New York.

Brooklyn, N. Y.—To Barber Asphalt Co., for regrading and repaving with asphalt concrete on macadam foundation in Lawrence st., Flushing, and College Point Causeway, from point 500 ft. north of Broadway to 13th st., at $11,932.75.

Larchmont, N. Y.—For about 5 miles of concrete sidewalks, to Daily & Merritt, of Port Chester, N. Y., at 18c. per sq. ft.

New York, N. Y.—For highway improvements as follows: Flushing and Astoria rd. from Old Bowery Bay rd. to Jackson ave., Newtown, 2½ miles, Thomas M. Hart, $26,540; Hempstead and Jamaica tpke., town of Jamaica, from Harvard ave., village of Jamaica, to Nassau County line, 3 miles, Uvalde Construction Co., $46,087; Central ave., town of Jamaica, from the Merrick rd., Springfield, to the Nassau County line, 2 miles, Continental Public Works Co., $28,749.

North Tonawanda, N. Y.—By Bd. Pub. Wks., for paving portion of Wheatfield st., to Warner & Downs, of Toledo, O., for $8,060.

Syracuse, N. Y.—For constructing Syracuse-Baldwinsville rd., 3.27 miles, to Jas. Anderson, of Brushton, N. Y., for Bermudez, at $19,347.

Troy, N. Y.—By Bd. of Contract and Supply, for straightening and paving Burden ave. at its intersection with Stow ave., to Edward Walsh, at $5,377.

Columbus, O.—By County Commissioners, for paving of Cleveland ave. between Columbus corporation line and Linden Heights, to A. G. Pugh.

Dayton, O.—By County Commissioners, for macadamizing Covington pike for 11-3 miles through Englewood, to Baker & York, Greenville, at $12,824.

Norwalk, O.—For constructing 2 miles of stone road in Wakeman Township, to Thomas Burton & Son, Wellington, O., at $8,200.

Sandusky, O.—For paving as follows: Huron ave. and Taylor st., to Andrews Asphalt Paving Co., of Hamilton, at $16,846 and $14,641; Jackson st., to M. J. Callin, of Sandusky, at $4,578.

Woodsfield, O.—For building Eastern rd., to Lewis H. Nixon, Nelsonville, O., at $18,499. Other bids as follows: Moore & Strahl, St. Clairsville, $18,890; Nelson & Harper, Barnesville, $18,880; W. W. Patton and L. P. Egges, $18,849.

Portland, Ore.—By City, for paving four streets in Kenton district with Westrumite, to Elwood Wiles, at $80,000.

Springfield, Ore.—By City, for paving of various intersections of Main st., to Universal Construction Co.; city will furnish crushed rock at $1.40 per sq. yd.

Williamsport, Pa.—By Highway Committee of Councils, for paving Ross st., to Busch & Stewart, at $1.99 per sq. yd., for Watsontown brick.

Johnson City, Tenn.—By City Council, for paving 23,000 yds. on Watauga ave. and Roane st., to Cleveland Trinidad Asphalt Paving Co., of Cleveland, at $53,000, and for guttering on same streets, to Geo. R. Brown, at $6,000.

Seattle, Wash.—By City, for grading and curbing 39th ave. So., to Sloane Bros., at $2,619; grading East Pine st., to Sparger Concrete Co., at $5,078.80.

Seattle, Wash.—By City, for grading, etc., Brandon st., to Andrew Peterson & Co., at $66,710.50.

South Bend, Wash.—By City Council, for paving on Water st., distance of seven blocks, to John Contracting Co., of Seattle, at $1.10 per cu. yd.

Spokane, Wash.—By City Commissioners, for grading Cochran st., 7th ave. to Winona ave., estimate $3,900, to Abbott & Joslin, at $3,680; for grading 33d ave., Perry st. to 1,300 ft. west, estimate $3,700, to A. Wold, at $3,650.

Spokane, Wash.—By City, for grading Olympic ave. from Nevada to Lidgerwood st., to C. M. Payne, at $7,180.

Spokane, Wash.—For paving 2 miles of Sunset blvd. with water-bound macadam, to O. Hogge & Co., at $11,978.67.

Wheeling, W. Va.—For repairing Top Mill rd. above Wheeling, to Contractor Dixon, at $40,000.

Racine, Wis.—By City, for paving Owen ave., to Western Improvement Co.

BIDS RECEIVED

Los Angeles, Cal.—For improving portions of San Fernando rd., to cost about $50,000: (a) grading per cu. yd., (b) Class A concrete per cu. yd., (c) Class C concrete, (d) reinforcing steel per lb., (e) pipe rail, (f) pipe culvert and segmented pipe per ft., (g) standard guard fence per ft., (h) barb wire fence per ft.: J. J. Prendergast bid (a) 50c., (b) $12, (c) $11.50, (d) 5c., (e) $2.50, (f) 16-in. $1.50, 24-in. $2, 30-in. $2.50, 36-in. $3, (g) 50c., (h) 12c.; Rife & Frenzel, (a) 75c., (b) $16, (c) $13, (d) 6c., (e) $2, (f) $2, $2.50, $3, $5, (g) 40c., (h) 25c.; John D. Polcaro (a) 80c., (b) $14, (c) $12, (d) 5c., (e) $1.50, (f) $1.50, $2, $3, $3.50, (g) 75c., (h) 12c.; Hudson, Johnson Construction Co., (a) 95c., (b) $13, (c) $12, (d) 4½c., (e) $1.50, (f) $1.25, $1.75, $2.75, $3.25, (g) 75c., (h) 10c.

San Bernardino, Cal.—For macadamizing and constructing concrete gutters and culverts on 8th st., between D and G sts.: Ernest Freuzel, $9,931 (awarded contract); Johnson-Shea Co., $10,486; John Newman, $10,689. The item bids were: 8.6c. per sq. ft. for paving and 40c. per lin. ft. for 3-ft. cement gutter.

Hartford, Conn.—For State Highways as follows: Town of Watertown, 8,110 lin. ft. macadam or gravel road, 16-ft. roadway on the Waterbury Turnpike: Ahern Bros., Norwich, Conn., $1.60 per lin. ft. for gravel, $2.50 for telford, $2.90 per lin. ft. for macadam, $3.50 for telford; $3.30 per sq. yd. for brick pavement, $1 per lin. ft. for rubble drain, 75c. per sq. yd. for cobble gutters, $6 per cu. yd. for masonry walling, 44c. per lin. ft. for pipe railing; Mascetti & Holley, Torrington, Conn., $1, $1.75, $3.30, $3.80, $2.75, $1, 80c., $4, 60c.; F. Arrigoni & Bro., Middletown, Conn., $1.93, $2.53, $3.96, $4.86, $2.10, $1, 65c., $7, 60c.; Edward McManus, Waterbury, Conn., $1.66, $2.56, $4, $4.60, $3.14½, $1, 57½c., $5, $1. Town of Old Lyme, 2,335 lin. ft. macadam-telford on new road, heavy grading, 16-ft. roadway: Ahern Bros., Norwich, Conn., $4.31 per lin. ft. for macadam, $4.86 for telford, $1 per lin. ft. for rubble drain; F. Arrigoni & Bro., Middletown, Conn., $2.97, $3.57, $1; A. Vito Corp., Thompson, Conn., $3.78, $4.38, $1.25; Donohue Bros., $3.74, $4.34, $1.

Wilmington, Del.—For street improvements as follows: Kennett sq. rd., John F. O'Neal, $29,500; Cornelius Mundy, $24,433; Clayton rd., Stewart & Donohue, $12,641.27; Horrigan Contracting Co., $12,837.29; Juniata Paving Co., $12,141.82; Philadelphia and Baltimore turnpike, Horrigan Contracting Co., $19,225.07; Stewart & Donohue, $19,218; Thomas J. Allen, $18,921.52; Newark and Elkton rd., White Clay Creek, Stewart & Donohue, $7,972.88; Patrick J. Mundy, $7,235; Juniata Paving Co., $8,810.60; Horrigan Contracting Co., $7,953.62; Thomas J. Allen, $8,151.56; Pencader hundred section, Stewart & Donohue, $11,241.20; Patrick J. Mundy, $12,267; Horrigan Contracting Co., $11,373.95; Thomas J. Allen, $11,229.30; Juniata Paving Co., $11,149.53.

SEWERAGE

Nogales, Ariz.—Voters have authorized $175,000 bond issue for installation of sewer and water system.

Chico, Cal.—Election will be held Oct. 12 for voting on $40,000 bond issue for construction of sanitary system.

Pasadena, Cal.—City will probably obtain sewage reduction plant and electrical incinerator.

Mason City, Ia.—Plans have been submitted to Sewer and Sanitary Committee of City Council for sanitary sewer system, to cost $36,000.

Fort Scott, Kan.—Resolution has been adopted providing for construction of East Side sewer system, to be known as Second District No. 2.

Lexington, Ky.—Bond issue of $150,000 is being considered for extending sanitary sewer system.

Winchester, Ky.—City Council has ordered extension of sewers on 1st ave., Jefferson, Georgia and Highland sts.

Franklin, Mass.—Special meeting will be held for discussing installation of sewerage system in west side of town.

Lowell, Mass.—Following resolutions have been passed: To lay sewer in Carlisle st. from end of present sewer southwesterly about 100 ft.; to lay sewer in Lincoln st. from present sewer in Main st. easterly about 170 ft.; to lay sewer in Merrill ave., from end of present sewer southerly about 622 ft.; to extend sewer outlets at West, Coburn and Fulton sts. into Merrimack River.

Lowell, Mass.—Sum of $34,260 has been appropriated for sewer work.

Minneapolis, Minn.—Construction of sewer on University ave., between Central and 1st Aves. N., has been approved of.

Chillicothe, Mo.—Ordinance is being considered for installation of new sewer system.

Springfield, Mo.—Election will be held in October for voting on construction of septic tanks to cost $100,000.

Trenton, N. J.—City Commission is considering site for erection of sewage disposal plant.

Las Cruces, N. M.—Bonds of $75,000 value have been voted for construction of sewer system and water works plant.

Binghamton, N. Y.—Ordinance has been passed for construction of storm water sewer in Liberty st.; estimated cost, $1,600.

Glens Falls, N. Y.—Taxpayers have voted bonding village for $40,000 to install sewer system.

Schenectady, N. Y.—Common Council has reauthorized $100,000 bond issue for sewage purposes.

Schenectady, N. Y.—City will construct sewer in Van Vranken ave., taking care of sewer of northerly part of city and emptying into Mohawk River.

Cincinnati, O.—Ordinances have been passed authorizing bond issue of $11,000 for sewering W. 6th ave. and Hillside ave.; $2,500 for sewer in Knox st. and $1,000 for sewer in Emming st.

Cleveland, O.—Installation of new sewage system is being considered.

Youngstown, O.—Resolution to establish Lincoln Park district sewer will be considered by Council.

Connellsville, Pa.—Plans are being discussed for installation of sewerage disposal plant.

Lansdale, Pa.—Council is considering calling election for voting on $75,000 bond issue for installation of sewage plant.

Reading, Pa.—Board of Public Works has adopted plans for enlargement and extension of Rose Valley Creek sewer.

Sharon, Pa.—Sewer disposal plant will probably be erected on site of present garbage grounds.

Woonsocket, R. I.—Appropriation of $4,480 has been made for providing of sewers in Elm st., Burnside ave. and Park pl.

Dillon, S. C.—Citizens have authorized issuance of $39,000 bonds for sewerage system.

Kingstree, S. C.—Election will be held for voting whether town should be bonded for putting in sewerage and water works.

St. Elmo, Tenn.—Election will be held Sept. 19 for voting on issuance and sale of bonds value $80,000 for constructing and maintaining sewers.

Bay City, Tex.—Petition has been received asking for election for voting on installation of sewer system and fire plug extension.

Beaumont, Tex.—Ordinance has been passed providing for issuance of $50,000 sewer bonds.

Dallas, Tex.—Municipal Commissioners have authorized construction of system of storm sewers.

CONTRACTS AWARDED

Prescott, Ark.—For 25,500 cu. yds. of excavation, 49,000 lin. ft. of sewer pipe, 120 manholes and sewer treating lead, to Hamilton Bros., at $20,196.

Oakland, Cal.—For construction of storm sewer at County infirmary, to Manuel Hoemen & Frank Souza, at $1,445. Other bidders were: Fred Lefler, $1,673; W. S. Furley, $1,587.50; T. Mathiesen, $1,485; Michael Heafey, $1,490, and H. Gould, $1,627.

Evansville, Ind.—By City, for construction of sewer in alley in block 13, Heidelbach & Elsas enlargement, to Meguiar Construction Co.

Marion, Ind.—By Board of Works for construction of sewer in alley between Bradford and Washington sts., and from Washington to Adams st. to Dillard Artir.

Wapello, Ia.—By City for 4,505 ft. 24 to 10-in. vitr. pipe sewer to W. A. Edgar, 1325 L st., W., Cedar Rapids, at $1.70 per ft., including 11 manholes and 21 catch basins.

Hutchinson, Kan.—For construction of several lateral sewers, to Polly & Welchon, at $1,497.10.

Wichita, Kan.—For constructing Sanitary Sewer No. 20, as follows: John Striffler, Wichita, Meriwether patent, lock joint reinforced concrete pipe, $173,475 (awarded contract); vitrified brick, $201,925; Parmley concrete, $171,659. Rushmore & Gowdy, Hutchinson, Kan., Meriwether concrete, $178,788; Cathroe & Fitch, Wichita, vitrified brick, $210,322; concrete, $181,408. Hall Contracting Co., Clinton, Mo., Wilson pipe, $169,149. H. J. McNichols, Chicago, Ill., vitrified brick, $182,459; Meriwether concrete, $199,240; Parmley concrete, $192,761; Deiter & Wenzel, Wichita, concrete, $201,343.

Other contracts were awarded as follows: Extension of Wichita drainage canal and storm sewer from Zimmerly st. to Big Arkansas River, to Pollard-Campbell Dredging Co., Omaha, Neb., at 9½ cts. per cu. yd. for excavation; total, $22,088.

Drainage ditch, from intersection of right branch of Chisholm Creek and 21st st. to Wichita drainage canal, about 300 ft. south of 19th st., to Wichita Construction Co., at 18 cts. per cu. yd. for excavation; total $2,740.

Malden, Mass.—By City, for Maplewood surfaced drainage work, to A. M. Cusack, at $4,032.

Caro, Mich.—For construction of 6 miles of sanitary sewer, to J. W. Collins.

St. Paul, Minn.—By Board of Public Works, for constructing sewer on Keston st. between Carter and Bourne aves., to O'Neil & Preston.

Paterson, N. J.—By Board of Public Works, for construction of both parts of section C of West Paterson-Totowa sewer, to Frank Puglia, at $3,692.45 and $5,101.75, respectively.

Westfield, N. J.—By Council, for construction of sewers in W. Broad st., Lawrence and Marion aves., to Middlesex Contracting Co., at $2,549.

Binghamton, N. Y.—By Bd. of Contract and Supply, to David Tumpusky, for constructing storm water sewer in First Ward, for about $8,463.

Brooklyn, N.Y.—For construction of dry-weather flow sewer in Rockaway rd., Jamaica, from Lefferts ave. to Panama st., and in Panama st. from Rockaway rd. to Stanley ave.; in Stanley ave. from Panama st. to Shenandoah st., and in Shenandoah st. from Stanley ave. to Jamaica sewage disposal plant, to William Kelly, at $66,740.05; also to Peace Bros., for building sewer in Pleasure ave., from 2d to Lawrence st., at $543.75, and in Jamaica ave., from 13th ave. to 18th ave., in Long Island City, at $2,513.75; to Evergreen Construction Co., for building sewer in Wilson ave., from 12th to 13th, for $535.70, and in Hunter ave., from Skillman pl. to Academy st. and Wilbur ave., all in Long Island City, at $775.75.

Hillsboro, N. D.—To Carrol & Sons, of Fargo, for work in Hillsboro, for about $7,000.

Bucyrus, O.—By Director of Public Service, for construction of storm water sewers in Mary, Perry, Jump, Sears, Myers and Ann sts., in all 7,214 ft. 8 to 24 in. pipe, to J. H. McKum, Bucyrus, at $5,555.

Cincinnati, O.—By City, for building of 13 sewers, to John M. McLane.

Findlay, O.—To Fred Kleinman, for constructing East Findlay sewer, about 3 miles in length, for about $11,151.

Erie, Pa.—For laying four sewers in 2d, Short, Cherry and 3d sts., to Joseph McCormick & Bro.

Williamsport, Pa.—For laying sewer in 7th ave. from Park ave. to High st., to Charles Dugan.

Williamsport, Pa.—For construction of 3 catch basins, two at Court and E. 3d sts. and one at Maple and High sts., to Emerson Stone Co.

Clinton, S. C.—To Dole & Myers, of Meridian, Miss., for constructing proposed sewer system at following bid: Excavation and backfill for 8-in. pipe, 35,805 lin. ft., 4 to 22 ft. deep, 16c. to $1 per lin. ft., according to depth; trench and fill for 10-in. pipe, 7,730 lin. ft., 4 to 14 ft. deep, 25c. to 65c.; trenching for 12-in. pipe, 4 to 6 ft. deep, 1,610 lin. ft., 30c. and 35c.; laying 46,145 lin. ft., 6, 8, 10 and 12 in. pipe, 13c. to 26c.; Ys, 30c. and 5c. each; 111 manholes, 4 to 18 ft. deep, $23 to $40 each; 24 flush tanks, 4 to 18 ft. deep, $40 and $45 each; 11 lampholes, each $5.50; 20 drop connections to manholes, each $2.50; cast-iron pipe per ton, $28; 50 cu. yds. rock excav., $1.50; 10 cu. yds. concrete, $8; tank No. 1, $1,200, and tank No. 2, $1,035; total, $27,193.

Seattle, Wash.—By City, for construction of sewers in Dexter ave., to T. Ryan, at $7,017.

WATER SUPPLY

Alabama City, Ala.—Bonds from $30,000 to $50,000 may be issued for water works and electric light plant.

Gadsden, Ala.—City Council is considering construction of reservoir to cost $15,000 or $20,000.

Nogales, Ariz.—Voters have authorized $175,000 bond issue for installation of water and sewer system.

Niles, Cal.—Mass meeting will be held for discussing water supply question.

Jacksonville, Fla.—Bids will be received until 3 p. m. Oct. 4 by Board of Trustees for purchase of water works and improvement bonds.—W. M. Bostwick, Jr., Chr.

Jesup, Ga.—Bids will shortly be asked for for sinking artesian well about 600 ft. deep, and as soon as a satisfactory supply of water is assured work of constructing plant and distributing system will be pushed rapidly.

Payette, Idaho.—City Council will shortly ask for bids for water works extension, approximately 15,000 ft. 4 and 6-in. machine-banded wooden pipe, hydrants, gates, etc.

Tampico, Ill.—Question of constructing waterworks is being considered, but nothing definite will probably be done for several months.

Boone, Ia.—Bids are being received by City Clerk for construction of two water mains.

Creston, Ia.—City has voted issuance of bonds for $10,000 for installation of waterworks plant.

Pierson, Ia.—Plans are being prepared by Lytle Construction Co., Sioux City, for construction of water works system.

Pisgah, Ia.—City is considering construction of water works system.

South Haven, Kan.—Special election will be held for voting on bond issue for municipal water works and electric light plant.

Lexington, Ky.—Fayette County will advertise for bids for laying water main on Maysville pike from city limits to line of Bourbon County.

Lafayette, La.—City Council has authorized $1,000 worth of water mains, same to be laid when needed.

Baltimore, Md.—Plans for dam to be built by city above present Loch Raven dam at elevation of 192 ft. are almost completed and will be shortly submitted to Water Board.

Calumet, Mich.—Election will be held Sept. 23 for voting on $33,500 bond issue, $9,000 of which to be contributed to water fund.

Springfield, Mo.—Election will be held in October for voting on $60,000 bond issue for building of municipal water works system.

Tucumcari, N. M.—City Council has decided on extensive improvements to water system.

Bloomingdale, N. Y.—Voters have authorized bond issue for $3,000 to complete water supply system.

Rochester, N. Y.—Bids for reinforcement of water distributing system on East Side, between 36-in. main in Culver rd. and 24-in. main through Public Market to Goodman st., by way of Leighton ave. and Leighton ave. right of way, by laying of a new 24-in. main, are to be advertised this week.

Seneca Falls, N. Y.—Board of Water Commissioners is considering purchase of Seneca Falls Water Co., for $150,000.

Charlotte, N. C.—City has sold bonds to value of $300,000 for water works extension.

Mott, N. D.—Town will vote on $10.000 bond issue for water works and fire equipment.

Akron, O.—Council is considering purchase of Akron Water Works Co.

Cincinnati, O.—Resolution has been adopted appropriating $1,500 for cleaning water mains in Park ave.

Cincinnati, O.—Resolution has been adopted by Council authorizing Commissioners to submit plans for water mains of adequate capacity to furnish water to former Latonia.

Cincinnati, O.—Board of Water Works Commissioners is considering extension of main from Clifton to city of Southgate.

Bristol, Pa.—Council is considering ordinance calling election in Nov. for voting on purchase of plant of Bristol Water Co.; estimated cost, $112,000.

Dillon, S. C.—Citizens have authorized issuance of $38,000 bonds for water improvements.

Kingstree, S. C.—Election will be held for voting on whether town should be bonded for putting in water works and sewerage.

Lake Andes, S. D.—Citizens are discussing project of having water system improved and extended.

Oneida, S. D.—Election will be held Sept. 19 for voting on $3,500 bond issue for purpose of completing municipal water works system.

Brady, Tex.—City has voted issuance of bonds for $40,000 for water works system.

Brownsville, Tex.—Bids for construction of drainage system to embrace 85,000 acres near Brownsville were rejected. New bids will be received Oct. 3.

Eagle Pass, Tex.—It is reported that plans have been prepared for dam 100 ft. high by 600 ft. long, across Devil's River, to supply water for irrigation of 156,000 acres of land in McKinney, Valverde and Maverick Counties.

Timpson, Tex.—City has voted $20,000 bonds for water works construction.

Ogden, Utah.—For erection of the Davis and Weber Counties water power plant, near Riverdale, to Lynch-Cannon Co.

Ellensburg, Wash.—Bond issue of $100,000 has been voted for municipal water system.

Seattle, Wash.—Citizens have voted municipal issue of $1,000,000 to enable city to extend its control over Cedar River water shed. Other bond issues were rejected.

Fond du Lac, Wis.—Election will be held Oct. 3 for voting on question of purchasing plant of Fond du Lac Water Co.

Fond du Lac, Wis.—Special election will be held Oct. 2 to decide whether city shall purchase water plant. It has been offered for $320,000, the price fixed by State Rate Commission.

Milwaukee, Wis.—Committee on Water Works has recommended resolution to appropriate $6,000 to make test borings for new intake.

CONTRACTS AWARDED

Los Angeles, Cal.—For construction of 500,000-gal. reinforced concrete reservoir on Angeles Mesa tract, to J. L. Ackland.

Oakland, Cal.—For construction of water plant on Altamont rd., to Peter Oxen & Co., at $7,888.45.

Thomaston, Ga.—For constructing water works and sewer system, to C. W. Murray & Co., Fort Valley, Ga., at $45,000.

Genoa, Ill.—By City for driving of 10-in. well from 100 to 200 ft. deep to W. B. Gray & Bros., Chicago, at $2.50 per ft.

Evansville, Ind.—By Water Works Trustees, for furnishing live steam pipes, miscellaneous pipes of all values, for filtration plant, to Evansville Supply Co., at $3,653.36.

Fort Levett, Me.—For constructing reservoir and tanks at Fort Levett, to N. E. Redlon Co., Portland, at $6,251.

Newton, Mass.—For concrete well, 28 ft. in diameter by 38 ft. deep, to T. Stuart & Son Co., at $8,900.

Eveleth, Minn.—For installation of water mains on Hayes st., to Pastoret-Lawrence Co., Duluth, at 61 cts. per ft. for 4-in. pipe; $19.50 each for hydrants; 5 cts. per lb. for specials; $9 per cu. yd. for rock excavation, and $1 per cu. yd. for earth.

Shakopee, Miss.—For sinking deep well, laying water mains and erecting standpipe, to J. G. Robertson, St. Paul, at $8,452.

Kansas City, Mo.—For installing water-tube boilers at Turkey Creek and Quindaro pumping stations, to English Tool & Supply Co., at $29,610.

Manhattan, Mont.—For constructing water works system, to Linstran & Owen, Billings, at $19,757. Other bids were: J. L. Penson, $22,024; Katz & Craig, $23,589; R. M. Bardson & Co., $20,871; D. J. Fresway, $20,187; W. D. Lovell & Co., $21,110; F. Beley, $22,759; Werdner & Rich, $20,940; A. C. Wans, $22,547.

Benedict, Neb.—For constructing water works system, to Alamo Engine & Supply Co., Omaha, at $9,999.

Ogallala, Neb.—By City, for constructing water works, from plans of Bruce & Standeven, Engineers, Bee Bldg., Omaha, to

Alamo Engine & Supply Co., of Omaha, for $17,382.

Fargo, N. D.—By City, for construction of pump house and power house of filtration plant, to James Kennedy, at $48,600.

New Lexington, O.—For constructing system of water works, to National Co., South Bend, Ind., at $44,000.

Oakley, O.—For laying 6-in. water pipe with necessary appurtenances from 30th to 33d st., to M. F. Quil., Cincinnati.

Soper, Okla.—For constructing water works system, to N. S. Sherman. Estimated cost, $13,000.

Vian, Okla.—By Bd. of City Trus., for installation of water works, to Terry Construction Co., of Poteau, Okla., for $17,364.

Pittsburgh, Pa.—By Department of Public Works, for coal and ash handling apparatus for Aspinwall pumping station, to Link-Belt Co., for $25,875.

BIDS RECEIVED

Fort Levett (Portland P. O.), Me.—Bids were received on Aug. 15 by Capt. G. O. Hubbard, Constr. Q. M., U. S. A., Portland, for pumping and storage plant, etc., at Fort Levett, as follows: (a) pump house and two well shelters, (b) concrete reservoir and tank, (c) pumps and pumping machinery, (d) furnishing and installing pipes, (e) complete work: Simpson Bros. Corporation, Boston, Mass., (a) $3,160, (b) $9,243, (c) $5,000, (d) $2,604, (e) $19,503, alternate $18,402; M. L. Bayard & Co., Philadelphia, Pa., (c) $5,000, (e) $20,000; John J. Fitzpatrick & Sons, Plattsburg, N. Y., (a) $2,939, (b) $11,655, (d) $2,092; R. L. Whipple & Co., Worcester, Mass., (b) $11,900; Frank H. Marshall, South Portland, (d) $2,498; John W. Danforth Co., Washington, D. C., (a) $2,850, (b) $9,485, (c) $5,214, (d) $1,800, (e) $18,000; A. L. Dow & Co., Portland, (d) $2,180; F. & C. B. Nash Co., Portland, (c) $5,333; Mahoney Construction Co., Portland, (a) $3,738, (b) $13,264, (c) $4,585, (d) $2,890, (e) $24,250; F. W. Cunningham & Sons, Portland, (a) $3,513, (b) $7,919, (d) $985; N. E. Redlon Co., Portland, (a) $5,000, (b) $6,251.

Boston, Mass.—The following bids were received on Sept. 1 by the Metropolitan Water and Sewerage Commission for a pumping engine of 3,000,000-gal. capacity, to pump against a head of 50 ft., and one of the same capacity against a head of 140 ft. Bids below are for the two pumps, the other figures being the guaranteed duty in million ft.-lbs., at full capacity: Laidlaw-Dun-Gordon Co., New York, for horizontal, cross-compound, crank-and-fly-wheel, engines, $7,525, $8,825, 107, 115; Cockburn Co., New York, horizontal, 3-cylinder, compound, crank-and-fly-wheel, $7,886, $8,738, 100, 110; Allis-Chalmers Co., Milwaukee, Wis., horizontal, cross-compound, crank-and-fly-wheel, $11,000, $12,500, 110, 116; the William Tod Co., Youngstown, O., horizontal, cross-compound, crank-and-fly-wheel, $11,000, $17,900, 100, 135; Nordberg Mfg. Co., Milwaukee, Wis., horizontal, cross-compound, crank-and-fly-wheel, $16,000, $17,000, 110, 124; Snow Steam Pump Works, New York, horizontal, cross-compound, crank-and-fly-wheel, against 140-ft. head, $9,735, 110; William Tod Co., vertical, triple-expansion, against 140-ft. head, $17,900, 135.—Dexter Brackett is Chief Engineer Commission.

Syracuse, N. Y.—The bids received for installing piping system at the Syracuse Institution for Feeble-Minded Children on Aug. 23 were: W. B. Armstrong, Albany, N. Y., $7,890; Frank Leavey, Syracuse, $8,984; Edward Joy Co., Syracuse, $9,889; Wm. P. Murphy, Syracuse, $9,987; Thomas F. Gildea, Syracuse, $9,100; Dennis McCarthy, Syracuse, $9,800; R. T. Ford Co., Rochester, N. Y., $8,587. For electric wiring: William W. Hyde, Central Islip, N. Y., $16,675; Conduit Electric Co., Syracuse, $16,987; Edward Joy Co., Syracuse, $17,750; Frost & Sheldon, Albany, N. Y., $19,326.

LIGHTING AND POWER

Alabama City, Ala.—Bonds from $30,000 to $50,000 may be issued for electric light and water works plant.

Alhambra, Cal.—City is considering installation of ornamental street lights on North Marquette ave., for about three-quarters of a mile; estimated cost, $1,200.

Stockton, Cal.—Election will be held for voting on publicly owned electric lighting system.

Waterbury, Conn.—Election will be held Oct. 3 for voting on installation of municipal electrical light plant.

Carrollton, Ga.—Franchise has been granted by Council to Georgia Power Co. for term of years.

Decatur, Ill.—Electric light and power plant recently destroyed by fire will be rebuilt.

Lewiston, Ill.—Five-year agreement for street lights has been signed, as desired by City Council.

Peoria, Ill.—City Council has voted to pay for electric current for ornamental lights in North Adams st.

Dugger, Ind.—Town Board has granted franchise to Sullivan Electric Co., to install electric light plant.

Oakland City, Ind.—Plans will be made and bids received for installation of new central heating plant to furnish heat to college buildings.

Peru, Ind.—Appropriation of $2,000 has been made by County Council for purpose of placing electric lights around new court house.

Colfax, Ia.—Franchise has been granted to Colfax Electric Light Co. to erect a transmission line from plant at Colfax to Prairie City.

South Haven, Kan.—Special election will be held for voting on bond issue for municipal electric light plant and water works.

Takoma Park, Md.—Town Council has authorized contract with Potomac Electric Power Co. for furnishing lighting facilities throughout Park.

Grand Rapids, Mich.—City has decided to install boulevard system of lighting for business districts.

Muskegon, Mich.—It is probable that Grand Rapids-Muskegon Water Power Co. will be given contract to furnish city with electricity.

Virginia, Minn.—Petition for "white way" on Central ave. has been accepted and filed and when necessary amount, $7,000, is levied improvement will be authorized by Council.

Bevier, Mo.—Construction of electric light plant by Fairbanks, Morse & Co., of St. Louis, has been approved of.

Parma, Mo.—Town has granted 20-year franchise to F. L. Harp, of National Motor & Supply Co., and has contracted with them for street lighting for 5 years.

Morrisville, N. J.—Ordinance has been passed granting Bucks County Public Service Co. permission to erect gas plant and mains.

Binghamton, N. Y.—Election will be held for voting on $158,200 bond issue for purpose of erecting municipal lighting plant.

Freeport, L. I., N. Y.—Municipal electric lighting plant will be improved at cost of about $10,000.

Oneida, N. Y.—Board of Public Works has extended time for receiving lighting bids until Oct. 3.

Thousand Island Park, N. Y.—Trustees are considering building of fireproof pumping and electric light station.

Akron, O.—Ordinance is being considered by Council for advertising for bids for electric, gas and gasoline lights for lighting city.

Dillon, S. C.—Citizens have authorized issuance of $3,000 for lighting system.

Runge, Tex.—Citizens are investigating possibility of putting up electric light plant to furnish lights for entire town.

Logan, Utah.—Installation of tungsten lamps on streets have been approved of, cost, about $2,200.

Ellensburg, Wash.—Bond issue of $100,000 has been voted for municipal electric plant.

Plymouth, Wis.—Thomas S. Watson & Co., civil engineers, are preparing specifications for new electric lighting system.

London, Ont.—Extension of ornamental street lighting system is being considered by citizens. Petition asks for 325 lamp standards, with cluster of five lamps on each.

Prince Albert, Sask.—Appropriation of $700,000 for construction of hydro-electric power plant at La Colle Falls has been authorized.

Red Deer, Alta.—Galt Engineering Co., Calgary, will make preliminary surveys for construction of municipal hydro-electric plant.

CONTRACTS AWARDED

Jacksonville, Fla.—For superstructure of new electric power station, to W. T. Hadlow & Co., at $44,232. Other bidders as follows: W. P. Richardson Co., $45,742; Lightman, McDonald Co., $46,300. Contract for moving four pumps and two condensers, to Allen Contracting Co., at $828.

Fort Wayne, Ind.—By City, for ornamental lamp posts, to Kerr-Murray Co., at $39.70 per post.

Gary, Ind.—To install heating plant in new $300,000 school building, to Johnson Service Co., Chicago, at $4,392.

Logansport, Ind.—To A. J. Yawger & Co., for building concrete power dam at 10th st., at $10,985.

Roland, Ia.—For electric light wiring from Roland to Story City to light town of Roland, to C. B. Nelson, of Ames, at $402.42 per mile, and to C. W. Rowand Co., of Des Moines, for city work at lump sum of $2,896.

Bay City, Mich.—By City, for installation of 145 metallic flame arc lights for west side, to Thorne Electric Co., at $3,605.

Niles, Mich.—For improvement work on city electric light plant, to Allis-Chalmers Co., Milwaukee, Wis., material for which is to be delivered within 45 days. Contract calls for two generators, two switchboards and two exciters. Board contemplates installation of new arc lights.

Defiance, O.—For grading above power dam of Anglaize Power Co. on west side of river, to Clemmer & Johnson, of Hicksville, and on east side, to Clarke & Ramus, at 18c. per cu. yd.

Wilkes-Barre, Pa.—By lighting committee of City Councils for supplying city with gas and naphtha for three years, to Welsbach Light Co., at $29 a light per year, and naphtha for $31 per year.

Honea Path, S. C.—By Bd. Pub. Wks. for furnishing machinery, boilers, pumps, engines, etc., and materials for electric light plant, and for c. i. water pipe, valves, lead, etc., and tank for water plant, also deep well, from plans of Thos. W. Cothran, of Greenwood, as follows: Boiler and accessories and engine with equipment to Phoenix Co., of Meadville, Pa., for $2,100; generator, exciter and switchboard, arc lamps, series lamps, regulators, switchboards, transformers, cut out blocks, fuse wire, electric watt-hour meters and motor to Westinghouse Elec. & Mfg. Co., for $2,700; wire and line hardware, Southern Elec. Co., Baltimore, $3,300; poles and electric control valves to J. F. Blount, Atlanta, Ga., $860 and $150; gate valves, pig lead, hemp, pipe-cutting machine and water meter boxes to Crane Co.; fire hydrants to Columbian Iron Works; water mains, cast pipe, specials, etc., U. S. Cast Iron Pipe Co., $45 per ton. Triplex pump, air compressor, tank and tower, water meters, deep well, pump house, boiler house and engine room, galvanized pipe and goose necks and cork cocks not yet let.

Sistersville, W. Va.—By Sistersville Electric Light & Power Co., for one 20 x 24-in. twin tandem, horizontal, double-acting, 4-cycle gas engine, to operate with natural gas and is rated at 1,000 hp., being arranged for direct connection to 650-kw., 60-cycle, 2,300-volt railway generator, to Mesta Machine Co., Pittsburgh, Pa.

Minocqua, Wis.—To Central Construction Co., Oshkosh, Wis., for installation of lighting system, at cost of $7,500.

FIRE EQUIPMENT

Birmingham, Ala.—Erection of fire station in Fairview section is being considered.

Mesa, Ariz.—Council is considering improvements to fire department.

Fort Smith, Ark.—Plans are being considered for erection and equipping of two fire stations.

Little Rock, Ark.—New fire station will be erected on Arch st.

Fairfax, Cal.—Purchase of chemical fire engine is being considered.

Oroville, Cal.—Board of Trustees is considering purchase of auto chemical and hose wagon for fire department.

San Leandro, Cal.—Board of Trustees are considering bond issue of $10,000 for installation of fire alarm system.

Wallingford, Conn.—Appropriation of $1,500 has been made for purchase of fire hose.

Pensacola, Fla.—Appropriation of $3,000 has been made for purchase of 3,000 ft. of fire hose.

Boise, Ida.—It is rumored that $40,000 has been voted for erecting and equipping fire stations.

Lincoln, Ill.—Fire department is considering $5,500 combination hose and chemical wagon.

Mattoon, Ill.—Bids will be received for two combination hose and chemical wagons by chairman of fire committee.

Fort Wayne, Ind.—City Council is considering purchase of auto-chemical engine.

New Castle, Ind.—Fire station to cost $8,000 will be erected.

Mondamin, Ia.—Election will be held for voting on $1,000 bond issue for purchase of fire apparatus.

Frontenac, Kan.—Fire department is contemplating extensive improvements.

Hutchinson, Kan.—Citizens will shortly be called on to vote on $20,000 bond issue for establishment of three fire stations.

Lake Charles, La.—Plans are being prepared for fire station to be erected in Fourth Ward.

Monponsett, Mass.—Purchase of hose wagon and chemical extinguishers are being considered.

Wakefield, Mass.—Committee is considering better fire equipment, and motor apparatus may be installed.

Pontiac, Mich.—Purchase of automobile chemical and hose wagon is being considered.

Stephen, Minn.—Erection of fire hall is being considered by fire department.

Glen Ridge, N. J.—Upon recommendation of fire committee the Council voted to continue work of eliminating fire alarm poles and building of conduits for wires.

Keansburg, N. J.—Purchase of combination chemical and ladder truck is contemplated.

Keansburg, N. J.—Erection of fire house is being considered.

Newark, N. J.—Bids are being asked for erection of fire house on Avon ave. and 13th st.

North Hackensack, N. J.—Funds are being raised for erection of new fire station.

Binghamton, N. Y.—Bids will be received until 4.30 p. m. Oct. 4 by S. W. Murray, Secy. of Board of Estimate, for purchase of four bonds of $5,000 each for improvements to fire department.

Mechanicville, N. Y.—Purchase of motor fire truck is being discussed.

Melrose, N. Y.—Citizens will purchase new chemical fire engine.

Yorkville, N. Y.—Erection of engine house on Main st., south end of Erie Canal bridge, is being considered; estimated cost, $5,000.

Mott, N. D.—Town will vote a $10,000 bond sisue for fire equipment and water works.

Akron, O.—Council is considering purchase of 3,000 ft. of hose and $500 for repairs at Nos. 1 and 5 fire stations.

Columbus, O.—Erection of fire house is being considered.

Harrisburg, Pa.—Fire chief recommends appropriation of $20,000 for purchase of auto fire apparatus.

Liberty, Pa.—Purchase of auto-combination fire truck is being considered.

New Brighton, Pa.—New apparatus and additional station are being considered for fire department.

Oakland Beach, R. I.—Purchase of two-wheeled piece of chemical apparatus with two 40-gal. tanks is being considered.

Pawtucket, R. I.—Bids are being received for construction of fire station for South Woodland section of city; estimated cost, $15,000.

Woonsocket, R. I.—Purchase of $5,000 auto combination fire truck has been voted for.

Bay City, Tex.—Petition has been received asking for election for voting on installation of fire plug extension and sewer system.

Crystal City, Tex.—City will purchase chemical engine and hook and ladder outfit.

Longview, Tex.—Automobile fire truck to cost $7,500 will be purchased.

Yoakum, Tex.—Installation of auto-fire apparatus is being considered.

Everett, Wash.—It has been recommended that bids should be called for gasoline combination engine and hose cart.

Elm Grove, W. Va.—Purchase of two chemical engines and 500 ft. of fire hose has been ordered.

Martinsbug, W. Va.—Fire station to cost $4,000 will be erected at N. Queen and 2d sts.

CONTRACTS AWARDED

White Castle, La.—By City Council, for supplying 250 ft. of Red Cross fire hose, to Eureka Hose Mfg. Co., of Atlanta, Ga.

Williamstown, N. J.—By Fire Commissioners for building two new hose houses to Lewis De Hart.

Wheeling, W. Va.—By City, for purchase of 1,000 ft. of Republic Rubber Co. hose, to B. E. Adams & Son, at $1 per ft.

BRIDGES

Birmingham, Ala.—Plans have been proposed for new highway bridge over Warrior River on road from Warrior to Blountsville, part of Decatur-Birmingham highway. Structure will be of steel with one span of 400 ft.; cost, $15,000.

Oakland, Cal.—Improvements to approaches of Piedmont bridge over Pleasant Valley have been decided upon; cost, about $75,000.

Redding, Cal.—Board of Supervisors of Shasta County and Tehame County are considering plans for bridge at Battle Creek, near Anderson.

San Bernardino, Cal.—San Bernarndino County will shortly erect three bridges.

Suisun, Cal.—Supervisors have contracts for construction of two reinforced concrete bridges, one in Suisun Valley, to cost $2,295, and one in Pleasant Valley, to cost $4,000.

Washington, D. C.—Construction of bridge across Rock Creek at P st. is considered, at cost of $275,000. Bids will probably be asked early next year.

Bradentown, Fla.—Election will probably be held in November for voting on construction of bridge across Manatee River between Bradentown and Palmetto.

Atlanta, Ga.—Construction of bridge over Altamaha River near Baxley has been approved of by Chamber of Commerce, and Atlanta will be asked to contribute $5,000 toward same.

Richmond, Ind.—Wayne County Commissioners have decided to build bridge over Whitewater River, in south part of city, of concrete construction, about 700 ft. long and 60 ft. wide. Main arch will be 96 ft. above water line. Plans for structure will not be complete before next year. Cost between $75,000 and $100,000.

Des Moines, Ia.—Preliminary plans for proposed bridge over Des Moines River at North st. have been submitted to Council.

Atlantic City, N. J.—Construction of bridge across Egg Harbor Bay between Somer's Point, this county, and Beasley's Point, Cape May County, connecting Ocean City, has been approved of.

Auburn, N. Y.—Plans are being prepared for construction of overhead bridge over tracks of West Shore Railroad at Port Byron.

Cincinnati, O.—Ordinance has been passed for improving and repairing truss bridges over Miami and Erie Canal at Sycamore, Vine, Race and 12th sts.; estimated cost, $2,582.

Massillon, O.—City Council has passed ordinance to issue bonds of $3,000 for paying portion of cost of proposed lift bridge across canal in Main st.

Chickasha, Okla.—Election will be held Oct. 17 for purpose of voting on $40,000 bond issue for erection of bridges over Grady County streams.

Bristol, Pa.—Work will shortly begin replacing old King's bridge over Adams Hollow Creek, boundary line between Bristol Borough and Bristol Township, with concrete span of 60 ft.

Fort Worth, Tex.—Construction of new bridge over Trinity River is recommended.

Houston, Tex.—Reinforced concrete bridge will be constructed over White Oak Bayou on Houston ave. Bids will be asked for at once.

Huntington, W. Va.—Bids will be readvertised for construction of superstructure of Russell's Creek bridge across Guyan River.

Appleton, Wis.—Outagamie County Board of Supervisors are considering construction of steel bridge over Fox River at Kimberley, to cost $25,000.

CONTRACTS AWARDED

Colusa, Cal.—By Supervisors for building five concrete spans of bridge across trough west of city to Mann & Skinner, of Chico, at $2,897.

Oakland, Cal.—For repairing bridge across Arroyo Valle, to Peter Oxen & Co., at $3,841.60. Other bidders were: Cotton Bros. & Co., $4,735; Hyde, Harjes Co., $4,115; Fred Leffler, $4,058, and F. Rose & Sons, $4,168.55.

Oakland, Cal.—By Board, for building bridge and retaining wall at Brightside, to Hyde, Hayes & Co., at $3,496.80. Other bidders were: Peter Oxen & Co., $3,448; Fred Leffler, $3,496.80, and F. Rose & Sons, $3,557.

San Jose, Cal.—By Board of Supervisors, for bridge work as follows: Bridge, west crossing of San Tomas Aquina Creek at Latimer ave., to M. E. Kilcourse, bid $400; bridge over San Francisquito Creek on Embarcadero rd., to John Doyle, bid $3,732, San Mateo County to pay half of cost; abutment on bridge over Campbell Creek at Harriman ave., to M. E. Kilcourse, bid $815.

Jacksonville, Fla.—For building two concrete bridges across Cedar Creek and Money Branch, to H. H. Scott, at $1,058.20 and $1,179.20, respectively. Other bids were: Cedar Creek bridge, Carolina Concrete Co., $1,224; Southern Bridge Co., $1,470; Camp Mooney Branch bridge, Southern Bridge Co., $1,630; Carolina Concrete Co., $1,324.

Payette, Idaho.—For furnishing material and constructing steel highway bridge across Canyon Snake River near Payette. Bids are for completed structure, 646 ft., four 160-ft. spans, 60-ft. concrete filled steel tubes, reinforced concrete abutments, to Minneapolis Steel & Machinery Co., $23,444. Other bids as follows: Omaha Structural Steel Co., $23,500; Central States Bridge Co., $27,027; Jas. J. Burke Co., $27,475; Midland Bridge Co., $27,000; Missouri Bridge & Iron Co., $24,961; Coast Bridge Co., $27,400; Rochester Bridge Co., $24,500; Hennepin Bridge Co., $27,000; Chas. G. Shelley, $27,900; Security Bridge Co., $25,100; Lynch Cannon Eng. Co., $34,440; Missouri Valley Bridge Co., $25,545.

Sullivan, Ind.—By County Commissioners, for construction of six concrete bridges in Sullivan County, to Vincennes Bridge Co., at $3,311.

Wichita, Kan.—For reinforced concrete bridge across extension of Wichita Drainage Canal at Harry st., to Deiter & Wentzel, Wichita, at $3,087.

Southampton, L. I., N. Y.—By Town Board, for building bridge over canal at Westhampton Beach, to Groton Bridge Co., at $10,189.

Troy, O.—For laying new floor over East Main st. bridge, Piqua, to A. S. Fox, of Dayton, at $2,297.

Lenape, Pa.—By County Commissioners, for constructing stone arch bridge over Brandywine River, to Corcoran Construction Co., of West Chester, for $17,952.

Vandergrift, Pa.—For repairs to County Bridge over Kiskimenals River, at Vandergrift, to Capital Construction Co., of Columbus, O., for $5,230.

Sioux Falls, S. D.—By County Commissioners, for construction of cement bridge over Sioux River at 8th st., to N. M. Stark & Co., of Des Moines, Ia., at $45,000.

Charleston, Tenn.—For construction of bridge, to Virginia Bridge Co., at $21,975. Other bids as follows: Joliette Bridge Co., $21,700, and Converse Bridge Co., $21,680.

Spokane, Wash.—For constructing Latah Creek bridge has been awarded to J. E. Cunningham, at $416,000.

MISCELLANEOUS

Troy, Ala.—City is considering erection of new jail.

Pasadena, Cal.—City will probably obtain electrical incinerator and sewage reduction plant.

San Leandro, Cal.—Board of Trustees are considering bond issue of $10,000 for erection of new city hall.

San Bernardino, Cal.—Special election will be held Oct. 4 for voting on $230,000 bond issue for construction of polytechnic high school.

Fort Wayne, Ind.—Board of Works will ask for appropriation of $4,000 for rebuilding of city's reduction plant on North Clinton st.

South Bend, Ind.—Appropriation of $40,000 has been made by County Council for purchase of 50 voting machines.

Carlisle, Ky.—City intends erecting city hall to cost $10,000.

Winchester, Ky.—Bids will be advertised for by City Council for erection of city hall.

Schenectady, N. Y.—Common Council has reauthorized $200,000 bond issue for school purposes.

Newark, N. J.—Election will be held in Nov. for voting on question of opening free public library.

Paterson, N. J.—Plans have been prepared for erection of public comfort station on Market st.; estimated cost, $7,500.

Herkimer, N. Y.—Plans for improvement of channels of W. Canada Creek & Mohawk River have been completed. Bids will shortly be asked for; estimated cost, $66,500.

Toledo, O.—Council is considering purchase of site on which to erect city hall.

Beaumont, Tex.—Ordinance has been passed providing for issuance of $25,000 abattoir bonds.

Corpus Christi, Tex.—Municipal wharf bond issue is under consideration.

Huntington, W. Va.—County Court has rejected all bids for county bond issue of $300,000, and same will be readvertised.

Powhatan, W. Va.—Town is considering numerous improvements and bonds for same will be issued.

Milwaukee, Wis.—City is considering establishment of two comfort stations, one on each side of Grand ave. bascule bridge.

CONTRACTS AWARDED

Louisville, Ky.—For wrecking old City Hospital, to H. H. Snyder & Co., at $3,000.

Atlantic City, N. J.—By City, for supplying firemen with uniforms, to Leonard D. Algar.

Buffalo, N. Y.—By Park Board, for erection of casino at Cazenovia Park, to Austin Summers, at $23,000.

Utica, N. Y.—By Board of Contract & Supply for collection and removal of garbage, to William Pritchad, at following prices: From Oct. 1, 1911, to Dec. 31, 1912, $1,352 per month; from Oct. 1, 1911, to Dec. 31, 1914, $1,365 per month; Oct. 1, 1911, to Dec. 31, 1915, $1,365 per month, or from Oct. 1, 1911, to Dec. 31, 1912, $20,280; from October 1, 1911 to Dec. 31, 1914, $53,235; from October 1, 1911, to Dec. 31, 1915, $69,615.

Port Arthur, Tex.—For construction of pleasure pier, to Blodgett Construction Co., at $42,800.

Puyallup, Wash.—By Council, for work of clearing Clark Creek, to R. H. Ward & Son, at $1,474.

Wheeling, W. Va.—For erection of market auditorium to Perkins & Jackson.

Shawano, Wis.—For erection of county asylum building, to Weinberg Construction Co., at $135,000.